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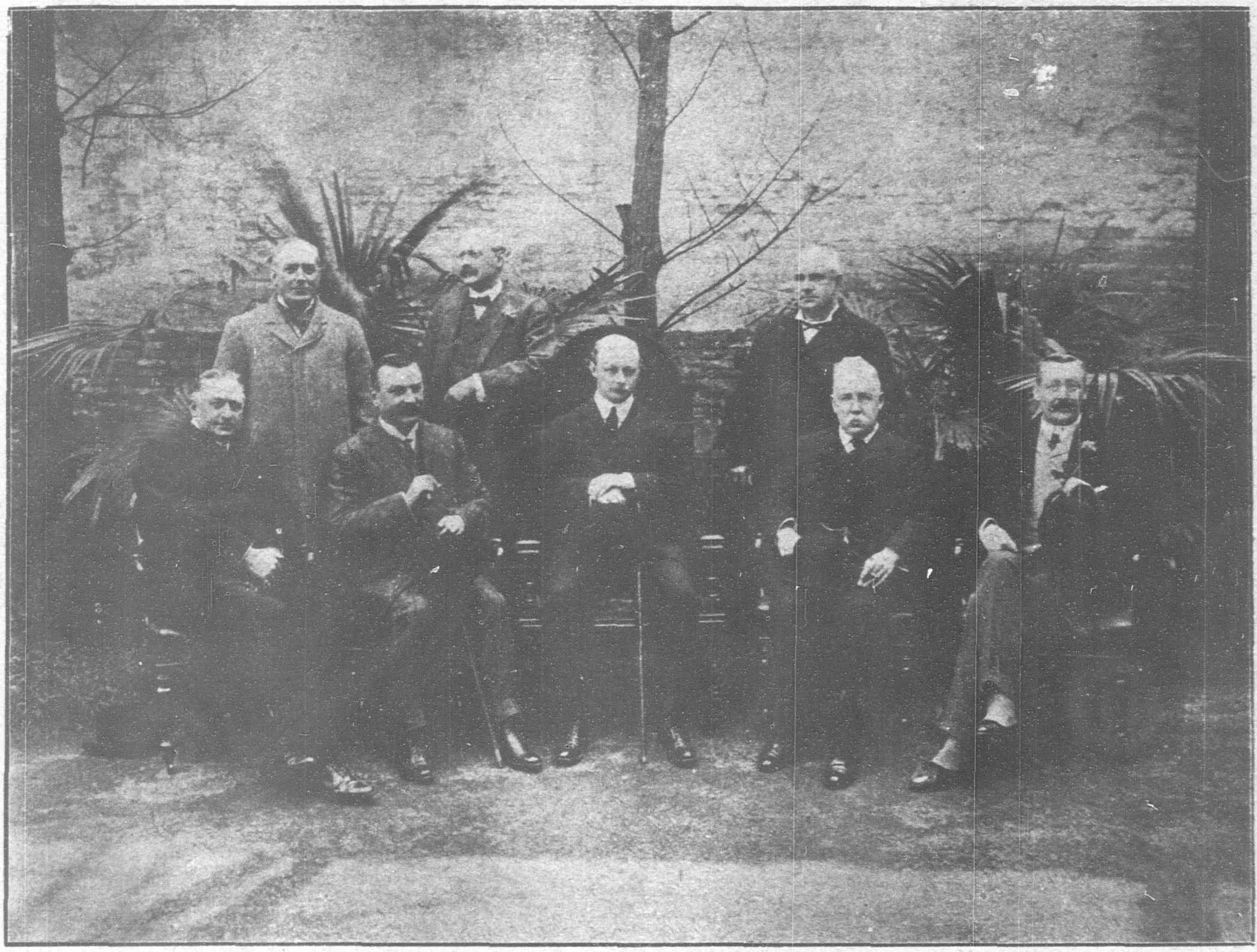

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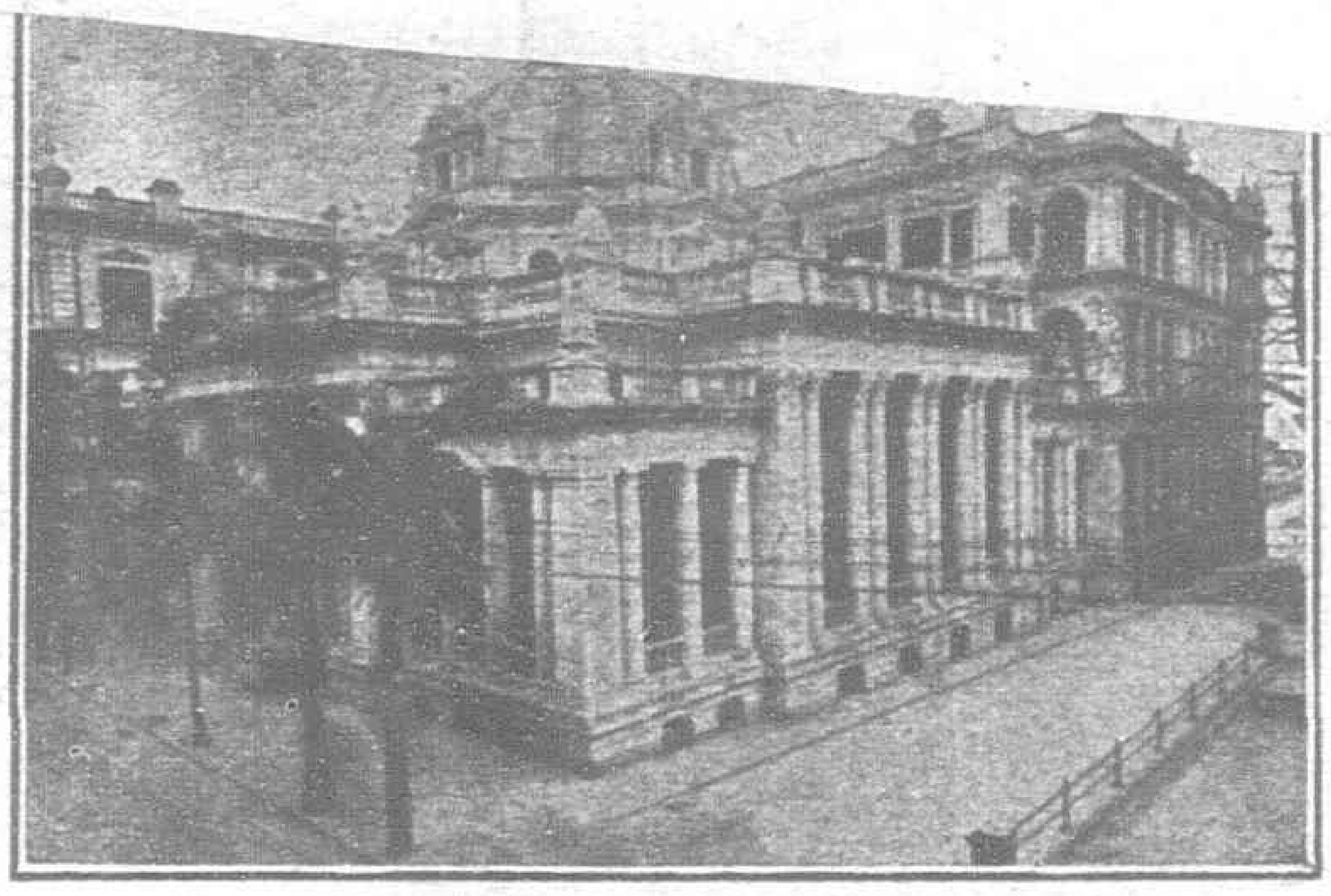

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THE FAR EASTERN REVIEW

COMMERCE ◆ ENGINEERING ◆ FINANCE

VOL. VI. MANILA, P. I., SHANGHAI, AND YOKOHAMA, JUNE, 1909 No. I.

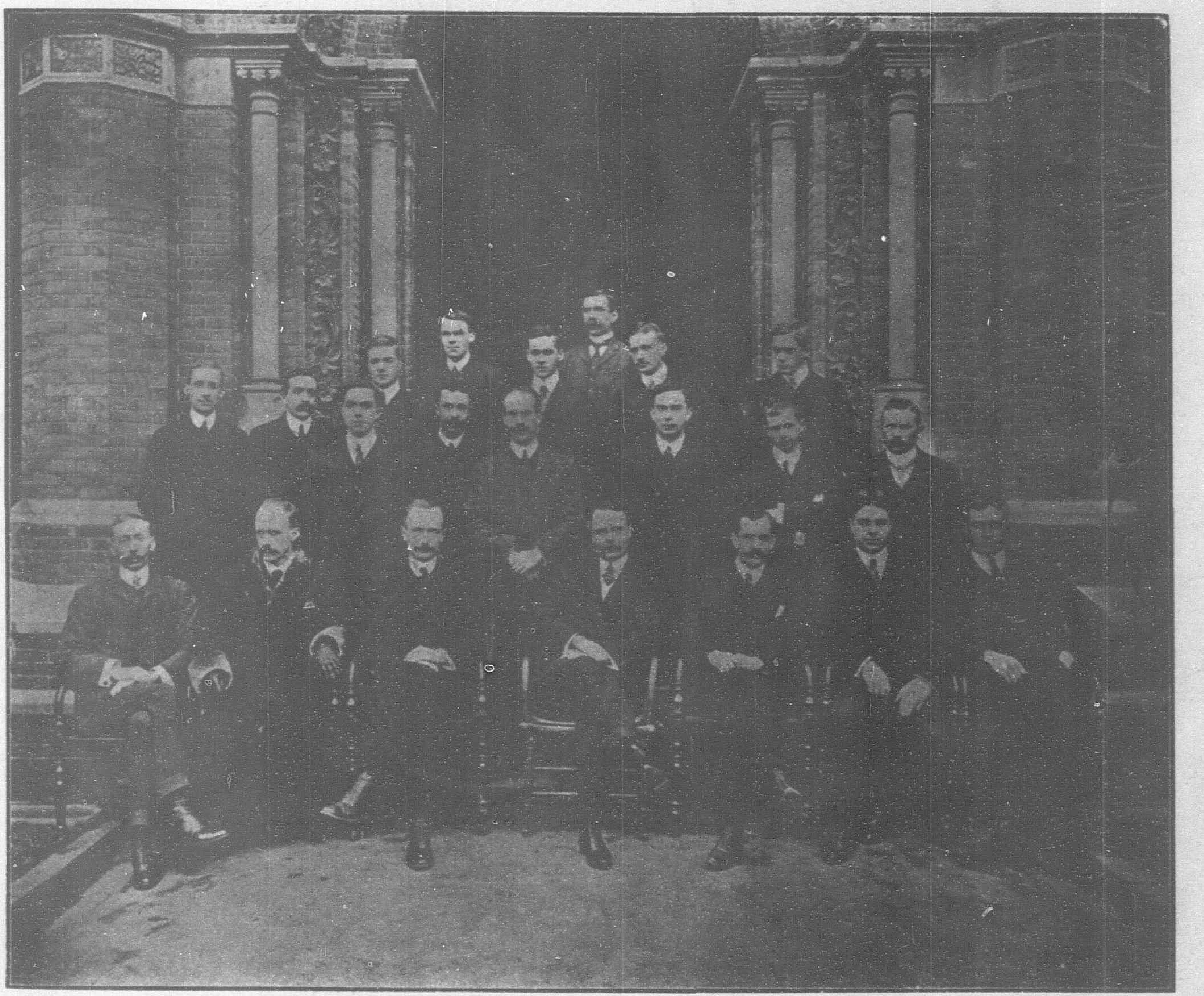
SHANGHAI PUBLIC WORKS

(From our own correspondent.)

The most interesting portion of the Annual Report for the year 1908 of the Shanghai Municipal Council is undoubtedly the section on Works Matters containing the Report of the Engineer and Surveyor. The brief sentence commencing the Report is in a way a surprise to many. "I beg to submit my twentieth Annual Report for the year ending Dec. 31, 1908." Twenty years at the head of the Department, twenty years as Engineer and Surveyor for the Municipality of Shanghai. When we stop to consider what the settlement was twenty years ago, nay, only seven years ago, when we look around and see the vast strides that have been made in developing the old treaty port into the fine cosmopolitan city of to-day, with its famous Bund, well-laid out

(Continued on page 4.)

INDOOR STAFF OF THE SHANGHAI PUBLIC WORKS DEPARTMENT



First row—*(left to right).*—P. Tilley, *Divisional Engineer.* R. C. Turner, *Chief Architectural Assistant.* C. H. Godfrey, *Deputy Municipal Engineer.* **C. Mayne, *Municipal Engineer,*** *(in Center).* C. Harpur, *Chief Engineering Assistant.* W. E. Sauer, *Chief Surveying Assistant.* J. E. Needham, *Divisional Engineer.*

Second row.—R. W. Gunson, R. E. Scatchard, H. E. Pollard, F. P. Bartley, B. L. Newman, R. C. Young, G. S. Barry, T. Thurnheer.

Third row.—G. H. Rendall, J. B. Johns, L. W. Hoffman, A. Diercking, H. R. Nielsen, F. G. Helsby.

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MANILA, SHANGHAI AND YOKOHAMA, JUNE, 1909

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A CHINESE LOCOMOTIVE SPECIFICATION

The following specification, attached to tenders for a locomotive, has been recently issued by the Kiangsu Railway Company, a Chinese concern operating the Railway between Shanghai and Kashing. Attached to the printed specification was an illustration on a card depicting a type of locomotive of a well known European manufacturer. The specification reveals three points of interest to the reader. The first is that it is an exact copy of the specification submitted to the railway, by the agents of the locomotive in question, and reveals the methods employed to disparage the efficiency of American locomotives, three of which are already working on the railway in question. Criticism of such tactics is of course superfluous. Again the fact of reprinting word for word such a specification from the maker's agent and sending them out for other competitors to bid on, gives the world an insight into the deep professional ability and knowledge of the officials of the road who published the tender.

While we may take the exception to some of Dr. Morrison's criticisms on the construction and equipment of this railroad, we must confess that his remarks about the inexperience and incapacity of the officials are somewhat strengthened by this recent exposure of their indiscretion and apparent inability to word their own specification.

SPECIFICATION FOR EIGHT WHEELED PASSENGER TRAIN LOCOMOTIVE WITH SEPARATE TENDER FOR THE SERVICE OF THE KIANGSU RAILWAY COMPANY

Gauge	4′ 8½″
Cylinder Diameter	18″
Stroke	26″
Driving wheel Diameter	69″
Engine truck wheel	39¼″
Driving wheel base	102¼″
Total wheel base	391¼″
Working pressure	170 lbs. per sq. inch
Grate area	24.75 sq. feet
Heating Surface	1260 sq. feet
Tank-capacity, water	2665 gallons
Tank-capacity, coals	6.5 tons
Weight empty of locomotive	99440 lbs.
Weight empty of tender	34760 lbs.
Weight loaded of locomotive	111760 lbs.
Weight loaded of tender	72160 lbs.

Total weight: 183920 lbs. equal to 83.5 tons

The specified locomotive is built according to the most improved design and the latest practice and experiences of locomotive builders especially as to accuracy and high finish.

Construction as well as workmanship cannot in any case be compared with those of American locomotives, which are not of the same high standard than these of European make. In consequence of this, American locomotives are cheaper, but they will last only for 10 to 20 years, while the locomotive offered by us will be capable of doing work full during 30 years and more.

Regarding the construction of our locomotive there is say that all parts subject to wear and tear by friction are provided with the proper lubricating devices: they are case-hardened as far as they are of iron or mild steel. Dimensions of these parts are calculated with good margins considering the fact, that they must fulfil what is expected from them under the greatest possible wear and tear. The locomotive boiler is provided with a steam dome and fitted with the necessary cleaning openings. All flanging of boiler plate is done with care by hydraulic presses. Revetting is also done by means of hydraulic machinery. The steam boiler as well as the engine is provided with all necessary fittings and safety devices, all principal parts, as piston cross head, etc., are made with especial great care. The locomotiev is equipped with central lubricating device, Janney-couplings, Westinghouse air brake, sandbox and device for wetting the tyres.

1). The offered engine is able to run up to a speed of 50 and more miles per hour, but under the prevailing conditions we consider the suitable maximum speed, at which the engine should be run 40 miles or say 120 li per hour.

2). Total traction power of engine at a speed of 7 miles per hour about 13000 lbs. equalling a hauling capacity of about 800 tons incl. locomotive, or about 708 tons load of train in these figures the frictional resistance is taken with 10 lbs. per ton load and adhesion is taken at 1-5 only. Both figures are taken very low and in America offers as rule 9-40 adhesion and lbs. resistance per ton are calculated in with which theory would give a hauling capacity of about 55% larger than stated above. Considering that the conditions of a track are not ideal, we adopt only figures as obtained in actual working condition.

3). All conditions otherwise the same as above, the engine will haul:
428 tons on a grade of ½ or say 7′ per li
308 tons on a grade of 1 or say 14′ per li
253 tons on a grade of 1½ or say 21′ per li

4). The offered engine is of the "Atlantic" type, and has 4 travelling wheels and 4 driving wheels, and represents a Standard engine as used in any country by the hundreds in modern Passenger Traffic.

—G. B. R.

MR. JOHN HAYS HAMMOND

The cabled announcement through Reuter's agency that the President has offered the post at Peking to Mr. John Hays Hammond is a striking instance of how the public opinion of the East is moulded through British news agencies. The only prominence attained by Mr. Hammond, according to Reuter, was the fact that he was sentenced to death by the Boers for his share in the Jameson Raid, and his qualifications for the post lie in the anxiety of President Taft to secure a good business man for the position in view of the international struggle for loans and concessions in which America has not hitherto shared. The *Shanghai Mercury* commenting editorially on the appointment says:

"It is difficult to believe that America under the Taft régime is about to join in the somewhat sordid and not very successful scramble for concession in China. The story that Mr. John Hays Hammond was offered the appointment of Minister to Peking, which Reuter wires on the authority of the New York *Herald*, is, however, somewhat startling, for we should have thought President Taft would not so degrade American diplomacy. Fortunately a later telegram informs us that Mr. Hays Hammond has declined the appointment, and it is to be hoped the President will now make a more satisfactory selection. Although Mr. Hays Hammond would no doubt have proved an excellent concession hunter, his record is hardly such as would have inspired confidence in his conduct in such an important position as United States Minister to China. Mr. Hays Hammond, who is by profession a mining engineer, was born in San Francisco in 1855. He was appointed special expert to the U. S. Geological Survey in 1880 which was engaged in examining the California Goldfields. He became consulting engineer for Barnato Brothers in South Africa in 1893. Later he joined Cecil Rhodes, and became one of his strong supporters in politics. He took an active part in the reform movement in Johannesbug which led up to the Jameson Raid. It is said he strongly disapproved of the raid, but after that fiasco he was one of the four leaders of the Johannesburg Reformers who were tried and sentenced to death by the Boers on the charge of conspiracy. The sentence was commuted to fifteen year's imprisonment and he was later released on payment of a fine of £25,000. He then went to London and engaged in mining speculations, and afterwards returned to the United States, and interested himself in various mining ventures. He has even travelled in Siberia gold hunting."

Why this appointment would degrade American diplomacy, and why Mr. Hammond should be characterized as an excellent concession hunter, and why his record is such as to discredit him for the post, is something which probably only the Editor of the *Shanghai Mercury* can explain. What is Mr. Hammond's record? As the *Mercury* accurately states in its quotation from Who's Who in America, Mr. John Hays Hammond is a Mining Engineer, but what our esteemed contemporary is apparently unacquainted with, is the fact that John Hays Hammond is the foremost engineer in his profession, being President of the American Institute of Mining Engineers, 1907-08, and the highest paid man in the world. His salary from one corporation alone is said to amount to $500,000 (gold) per annum, and on his decision millions are invested or otherwise. A record, which brings a man to the head of this profession and the enjoyment of the largest salary in the world, is one which must inspire confidence and respect despite the contention of our contemporary to the contrary. If he had been a lawyer, an educator, an ecclesiastic, an editor, or the top of his profession in any other line the inference is that his record would inspire confidence, but to be simply a strenuous and successful mining engineer, even to travelling in Siberia gold hunting, absolutely disqualifies him for a diplomatic post.

If this appointment was offered to Mr. Hammond by the President, we resent the imputation that it would degrade American diplomacy, in fact we distinctly contend that the service would be highly honored by his acceptance.

We hold no brief for Mr. Hammond and it was a foregone conclusion that he would decline the honor. As we know the policy of the President is to appoint a minister to Peking who will demonstrate some interest in commercial affairs, and may be commit the unpardonable blunder in the eyes of our European friends of seeking American participation in the development of China, we look forward to further criticism of any appointee who may have the presumption to declare his intention to interfere with the monopoly of Chinese mining and railway development, now held by European interests.

AMERICAN CONSULAR CHANGES

Shanghai, June 1st, 1909

American diplomatic and consular changes in China have furnished a topic for considerable comment. Mr. Denby's recall without explanation to report to Washington, and his subsequent transfer to the post at Vienna, has invoked much criticism from the American and foreign element. After the speech at Shanghai delivered when he was Secretary of War, it was hoped that, as President, Mr Taft would entertain the same opinion of Mr. Denby as uttered at that time in the following words: "The administration at Washington has, within the last three years, given especial attention to the selection of Consuls in China. This was made evident in the selection of both Mr. Rodgers and Mr. Denby as Consul General at Shanghai. It is a new sensation for an American to come to a Chinese city and find as its consular representative one who knows the Chinese language and who understands the Chinese Empire, as few Chinamen understand it. I congratulate you citizens of the United States on having such a representative, of your interests in this great commercial community as Mr. Denby."'

The transfer of Consul General Wilder from Hongkong to Shanghai certainly carries out the policy then outlined, as the new appointee is highly qualified for this important post, and there is little to choose between the two men. Although Mr. Wilder has not the advantage of such a long experience in China as Mr. Denby, and lacks knowledge of the language, he may be expected to fill the post at Shanghai to the entire satisfaction of shi government and everybody concerned. If judged by his record at Hongkong, it is distinctly fortunate for American interests that he has been chosen to succeed Mr. Denby. So in this appointment the President has fully lived up to his promises of two years' ago. While we may be puzzled as to the motives underlying the sudden transfer of Mr. Denby, the President has undoubtedly acted on what appeared to him as good grounds, and while we may deplore the action, yet we may have faith in the sense of fairness and justice of our Chief Executive to give Mr. Denby an opportunity to explain ex parte accusations that have been thought against him by unfriendly parties.

Mr. Denby leaves Shanghai with the sympathy and cordial friendship of not only his own countrymen, but the Chinese and foreign elements as well. It was hoped that the President would have recognized his worth by promotion to Peking, and many genuine expressions of regret have been called forth over his transfer to Vienna.

—G. B. R.

THE FAKUMEN AND ANHWEI RAILWAYS A CONTRAST

The contract for the construction of the proposed Fakumen extension of the Imperial Railways of North China was concluded by the Chinese Government with a representative of the British firm of Pauling's Ltd., and the loan for the work was financed through the British and Chinese Corporation. According to the Chinese version of these negotiations, this contract and loan were placed on the most favorable terms ever received by China. This secured for China the support of British interests, and has given her strength to combat Japan's prohibition to the extension. Apart from the universal sympathy extended to China, in her endeavor to extricate herself from the self denying clause of the secret protocol of the Peking Agreement, British opinion has undoubtedly been largely influenced from the fact that British firms were to construct and finance the work.

It would seem logical that China should show some appreciation of this support, but recent news frow Peking would indicate the contrary. Pauling & Company it appears also concluded an agreement with the son of the ex-Viceroy Chow-fu, Chou Hio-hsi, Director General of the Anhwei Merchants Railway Company, in which the British Company was to take over a loan of Taels, 10,000,000 to construct the various railways in Anhwei Province. Delivery of railway materials and the management of the lines was to be reserved exclusively to the British Company.

However, the Board of Communications has cancelled the agreement. While there is no objection to floating the loan, the condition that the delivery of railway materials and management shall be exclusively British is rejected.

—G. B. R.

CONCRETE VERSUS BRICK AND PIPE SEWERS

The committee on sewers of the Illinois Society of Engineers and Surveyors recently submitted an interesting report on the relative adaptability of concrete, brick and pipe sewers respectively, a résumé of which appears in the *Municipal Journal and Engineer* as follows:

"The perceptible changes in sewer construction have for the past few years been very slight, with a tendency toward the use of concrete, both plain and reinforced, in the place of brick and the larger sizes of vitrified tile pipes. "The City of Chicago was one of the first cities in the State to build a system of concrete sewers. Cairo, Decatur and Elgin have each a system of concrete trunk sewers; East St. Louis has a similar system in contemplation. The concrete system for all large storm or combined sewers has become a factor which will soon occupy first place, if indeed it cannot be conceded that position now.

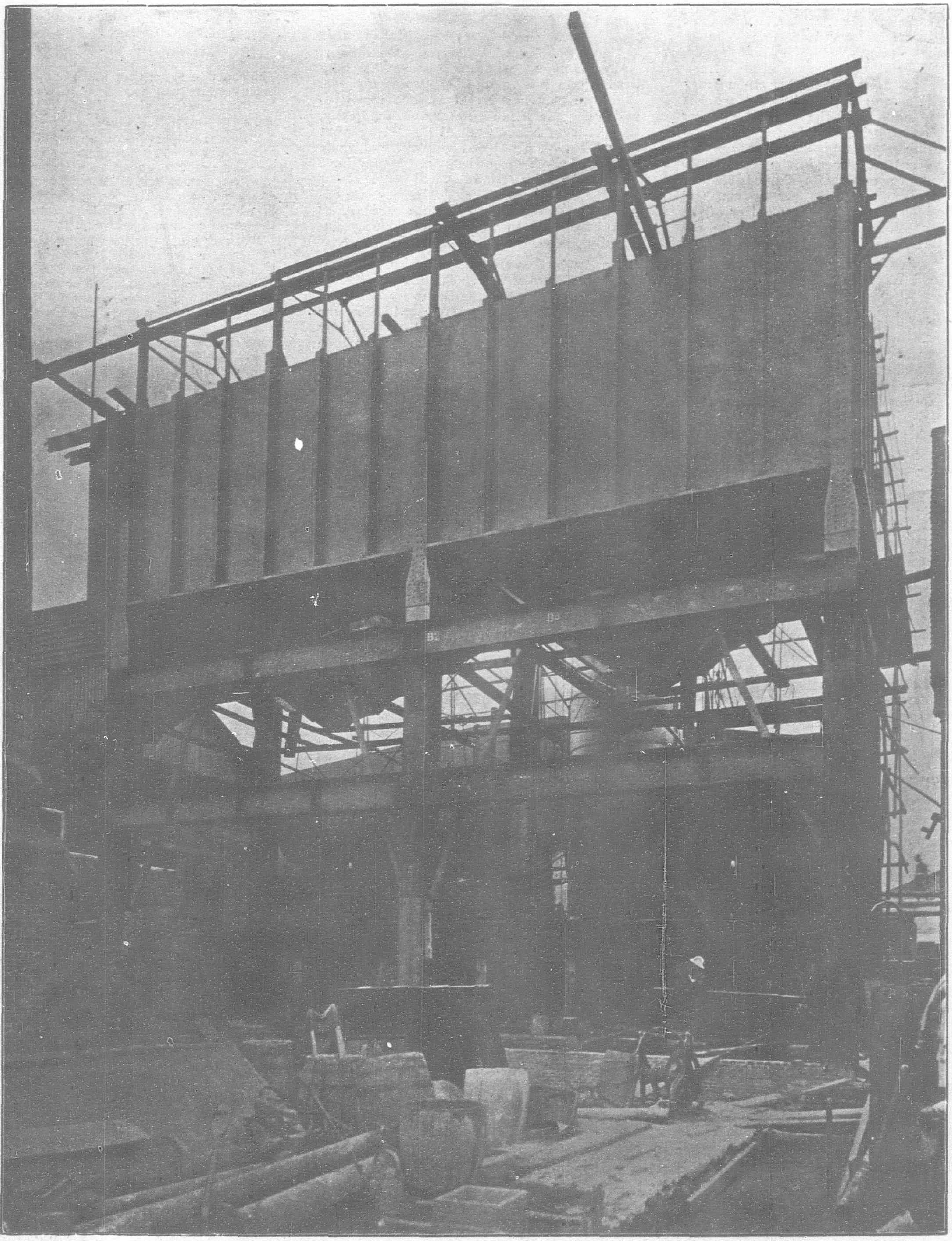
"Several papers have appeared since concrete-sewer construction has come into more popular practice under such general titles as 'Concrete *vs.* Vitrified Sewer Pipe' and 'Concrete *vs.* Bricks for Sewer Construction,' all of which are evidently intended to discourage the use of concrete for sewers.

"Taking up the articles under the first head, 'Concrete *vs.* Vitrified Tile Pipes,' we feel the zeal of the authors has allowed them to carry a comparison too far. Few concrete sewers have been constructed less than thirty-six to forty inches in diameter, which are the largest sizes of tile pipe. The two methods of sewer construction touch at but one point, and that point may be considered an extreme in both—the maximum diameter for pipes and the minimum for concrete. The most serious point raised against the use of concrete for sewers is the so-called disintegration of concrete claimed to be due to acids in sewage or formed from gases thrown off by septic action. The citations where concrete sewers have apparently disintegrated are scattered and few, the principal ones being Brooklyn, N. Y., Oshkosh, Wis., and San Francisco, Cal. Sewage to contain an objectionable amount of acid would of necessity be such as is found only in sanitary sewerage systems or the waste water from industrial plants where acids may be used. As yet the general practice for concrete sewers is their use for storm or combined systems. Lastly the acid reaction upon concrete has not been proven to be detrimental to any great extent, not as much to be feared as the alkalies of the arid regions of the West. Again if the action of the sewage will disintegrate the shell of a concrete sewer it will prove equally as detrimental to the mortar joints of pipe sewers. We need feel no uneasiness on account of the stability of either construction when conditions are normal, but the field of usefulness for each is so clearly defined and different that the trend of practice does not look toward the displacement of either method with the other.

"In 'Concrete *vs.* Bricks for Sewer Construction' many points appear for comparison, and apparently the only field that concrete enters as a competitor in sewer construction is that of brick. In comparing the two the question of any disintegration is practically eliminated as the chemical reaction of any solvents in sewage detrimental to concrete would prove equally as injurious to the mortar joints in brickwork. The amount of excavation required for both forms of sewers is nearly equal. Other points appearing so nearly the same in both brick and concrete sewers, there remains only to determine the relative cost of the two. In brickwork the shell can only be increased for different sizes of sewers by additional rings of brick which measure about four inches, while in concrete sewers the shell can be increased by as small an addition as one-half an inch. Probably the most effective argument in favor of concrete against brick construction is the fact that brick sewers can only be constructed with high-priced skilled labor, while for concrete the cheapest labor obtainable is often sufficient.

"As a general rule concrete sewers are constructed in circular or near circular form, the thickness of shell being one inch per foot of diameter plus a fixed number of inches, this constant varying from one inch in reinforced concrete to three inches for plain concrete. Steel centering is now very generally used in concrete sewer construction.

"The Committee on Sewers feel that the Society should, through its various committees, begin to take up the work of gathering and compiling data which could be tabulated and published and corrected from year to year so that soon we may have in the reports of our proceedings an index of the entire State relative to the condition and form of all public utilities such as sewers, disposal plants, water supply, filtration plants and drainage districts."



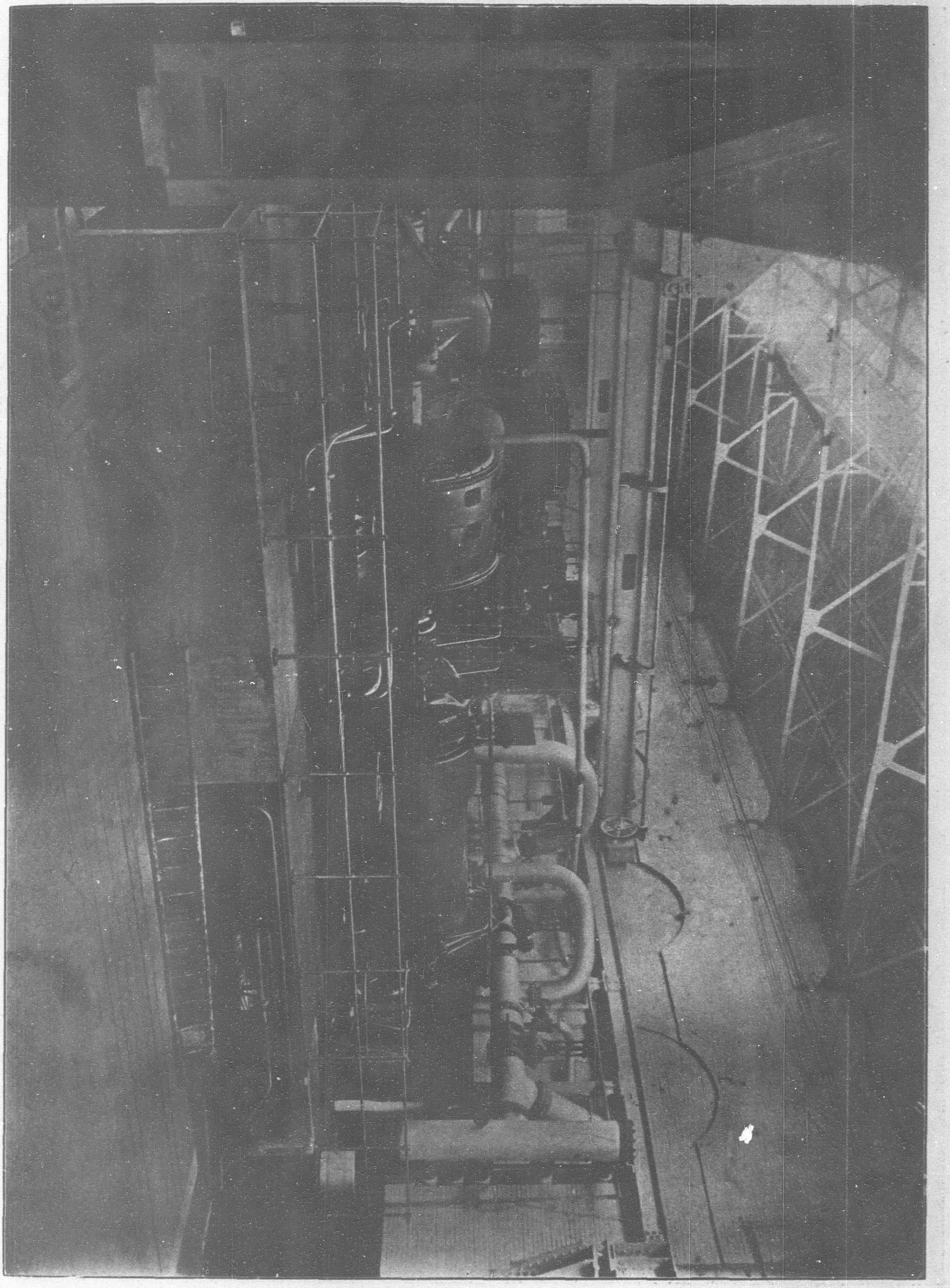
SHANGHAI MUNICIPAL ELECTRICITY WORKS.—BABCOCK AND WILCOX WATER TUBE BOILERS, OVERHEAD COAL BUNKERS, AND STRUCTURAL STEELWORK IN COURSE OF ERECTION.

SHANGHAI PUBLIC WORKS

(Continued from page 1.)

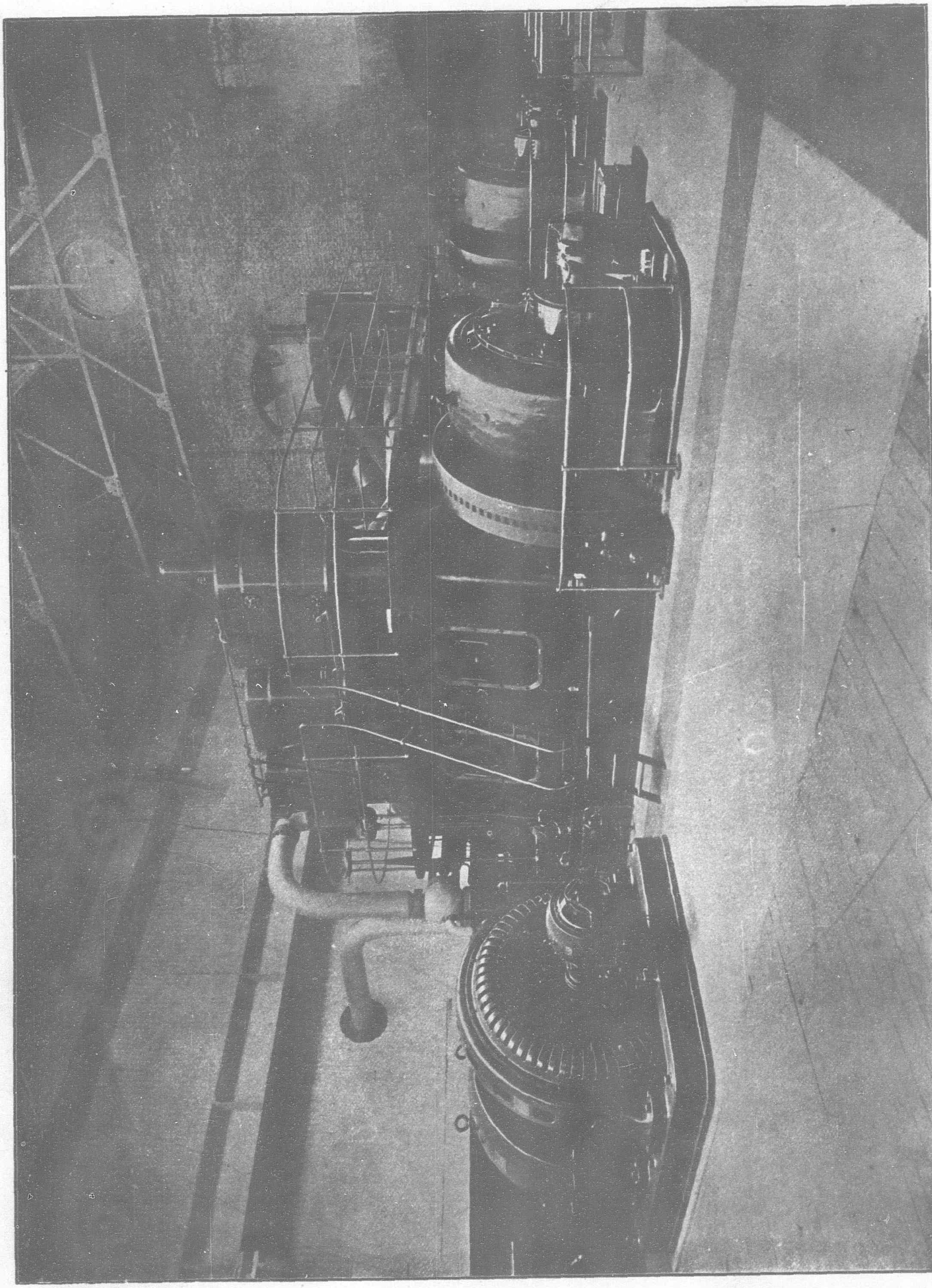
parks and recreation grounds, miles of streets and roads, handsome public buildings, bridges drainage system, and the many improvements which all lend to beautify the settlement, it is a revelation to know that all this work is directly due to the engineering guidance and supervision of one man. And yet, since 1889, the engineering work of the settlement has been directed by Charles Mayne, Member of the Institute of Civil Engineers and Member of the American Society of Civil Engineers, who is therefore largely responsible for all the vast improvements, and to whom is due the credit for the many excellent improvements which make the city so attractive. Such a record is difficult to equal, and speaks volumes for the efficiency of the man, and the wisdom and judgment of the various councils which have retained his services. From the viewpoint of the Engineer Shanghai, as it appears today, is an eloquent tribute and testimonial to the efforts and ability of its Chief Municipal Engineer.

When Mr. Mayne assumed charge of the Department in 1889, the Municipal Property List contained only the Central Offices, the Louza and old Hongkew Police Stations, four cemeteries, the Public Garden and Foreshore, and the Jessfield Road Depot. The Property List to-day embraces the Central Offices with Health and Fire Departments added, the fine

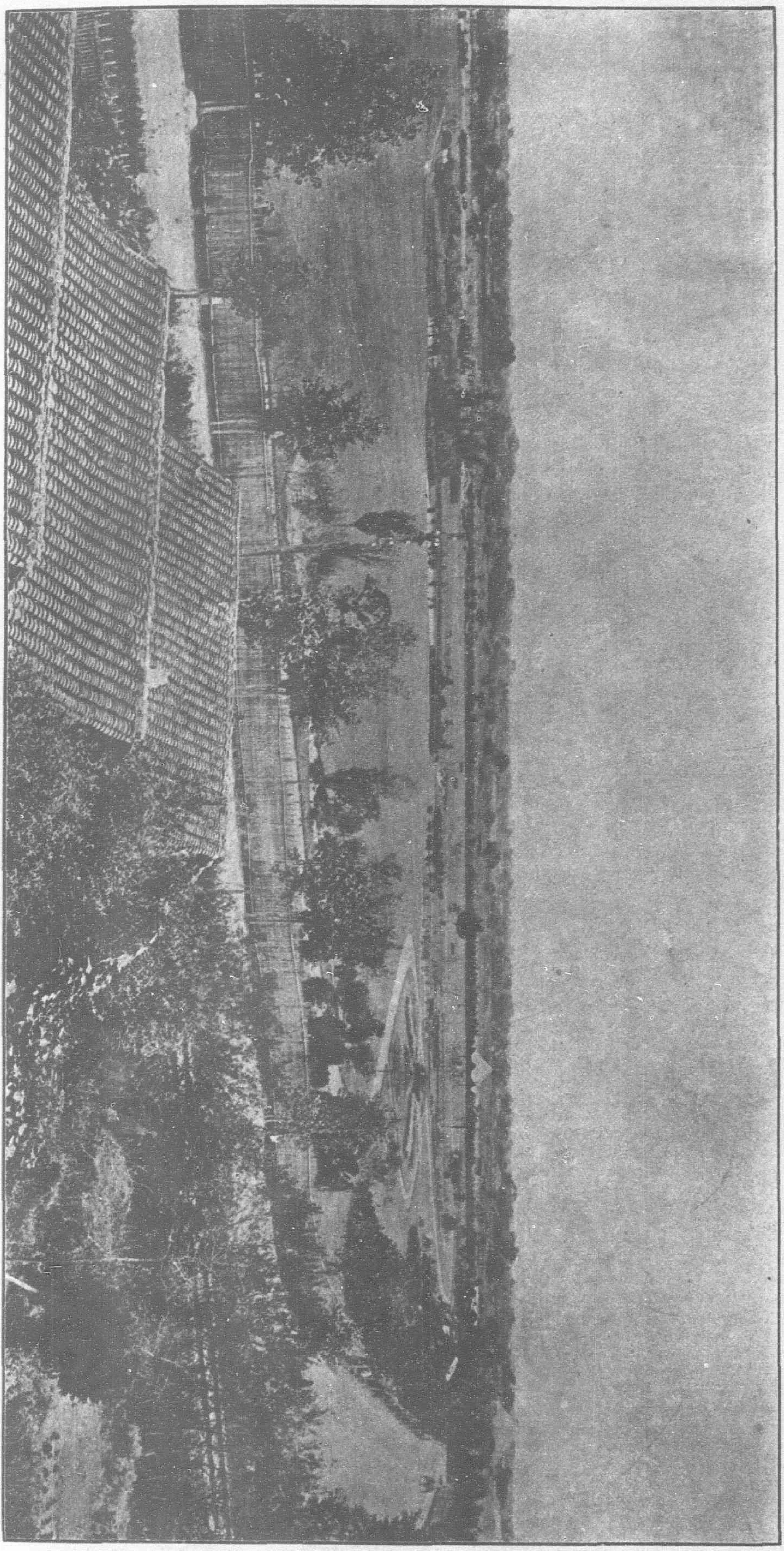


SHANGHAI MUNICIPAL ELECTRICITY WORKS.—PARSONS-PEEBLES 800 KILOWATT TURBO-ALTERNATOR.

Town Hall on Nanking Road, twenty Police Stations, including quarters, a large modern jail, four fire stations and a workshop, Volunteer Headquarters, Rifle Range and Riding School, four Hospitals, Public Swimming Bath, seven markets, a slaughter house and cattle sheds, six cemeteries, the electricity works and site for a new station, three public schools, ten parks or recreation grounds, a quarry, two nurseries, twelve works depots, drainage systems, latrines, etc., in addition to considerable surplus land, and 66 miles of new roads added



SHANGHAI MUNICIPAL ELECTRICITY WORKS.—TWO 600 KILOWATT BELLISS-PEEBLES TRACTION GENERATORS AND BRUCE PEEBLES 300 KILOWATT MOTOR GENERATOR.



HONGKEW RECREATION GROUND, SHANGHAI.

to the former mileage. Bridges, bundings, drainage, road extensions and widenings involving large expenditure have been successfully carried out.

In 1889, when Mr. Mayne commenced his labors, he had only one assistant engineer, and two outside foremen. To-day there are 33 salaried men connected with his indoor staff alone exclusive of writers, tracers, messengers, etc., with a total annual expenditure on pay and allowances of Tls. 130,562. In addition, there is a competent outside force on Roads, Parks, etc. During the last fiscal year Tls. 569,834 were employed on current expenditures to run the department and maintain ordinary works, and extraordinary expenditures amounting to Tls. 830,450 including a deficit of Tls. 201,513 from the previous year.

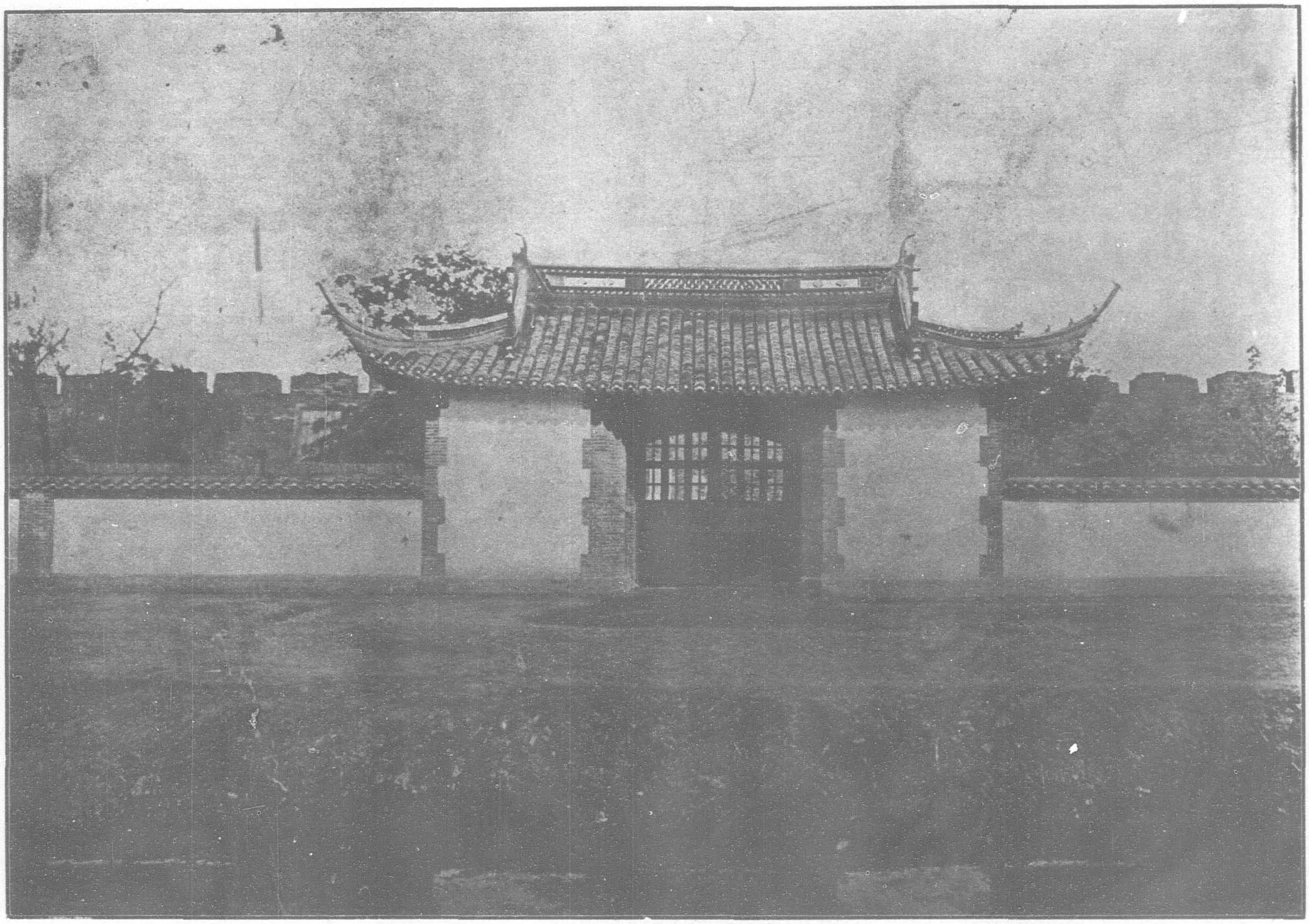
For the information of the Council and ratepayers, written reports are furnished on practically all public works, and the growth of the department can be appreciated by the fact that in 1889 seventy such reports were submitted, while, in 1908, 720 reports were forwarded. Under the supervision of the Engineer are several special branches, such as the Cadastral Office, Building Inspection, Concrete ware factory and quarry, which are of considerable magnitude, and the surveying Bureau. The Settlement was extended in 1893 and again in 1900, requiring a complete resurvey, and a staff of surveyors is constantly at work keeping it up to date. This branch of the Department is an important part of the work, as the land tax revenue depends on accurate surveys.

The Public Works Department of Shanghai was established as early as 1843 and its chief work for years was confined to the construction and repair of roads, jetties, surveys and surface drainage. With the growth of the Settlement other duties were added from time to time, and the scope of work extended to cover the situation. The area of the original settlement was 1,080 mow; with the addition of Hongkew in 1863 it was increased to 9,406; a further extension was secured in 1893 and another in 1900, which brought the area up to over 33,000 mow or about 9 square miles.

Roads.—One of the greatest difficulties encountered by the Department has been the question of uniform roads. It appears that the original Committee on Roads, in the early history of the Settlement, failed to foresee the great development of the port, and considered that a width of 22 feet was sufficient. This action on their part was undoubtedly traceable to financial reasons, for although land at that time could be purchased for 25 to 30 Taels a mow, the revenue appropriated for that department was insignificant, not exceeding 1,200 dollars, and in 1852 it was only $5,000 or barely sufficient to maintain the few roads in proper repair. As the Council lacked the right of eminent domain, the negotiations for the purchase of land for extensions or widenings had to be carried out with private owners, many of whom refused to part with their lands except at prohibitive rates, and as a natural consequence many roads are irregular in width and alignment. In 1899 the Council obtained compulsory powers under the articles of the new Land Regulations, and the Chinese authorities also authorized the expropriation of lands for road purposes at nominal rates. Since this date the extension of existing roads and the opening up of new ones have progressed in a very satisfactory manner. In 1889 the length of settlement roads was about 36 miles, while today there are 102 miles, of which 37 are macadam and 16 chip paved, 3 miles of brick and a short length of experimental Tar Macadam, while the balance are either dirt roads or roads in the process of construction. In addition there are 80 miles of sidewalks and footways, nearly half of which are laid in cement concrete, and the balance in chip and tarred macadam. There are six steam road-rollers and scarifiers kept busy on road work.

The heavy traffic on the main macadamized roads call for large maintenance expenses, and the Chief Engineer has advocated the relaying of these streets in wood blocks.

Hard wood blocks, although the most costly of all pavements, have given results that far surpass any other system. In the city of Sydney, N.S.W., many miles of block pavements are in use. Queen Street, with its great traffic over a block pavement, has shown a wear of one-sixteenth of an inch in eight years and the blocks were in almost as good a state as when laid. The best results came from the use of well seasoned heartwood blocks of jarrah or karri, tallow-wood, blackbutt or red or blue gum. These blocks were first dipped into hot coal tar and hot wood preserving oil and left to absorb, before being placed in position. The original cost of this type of pavement in Sydney was about 12 shillings per square yard, with an annual maintenance cost of about 1 penny per sq. yard.



SOLDIERS' CEMETERY.—GATE (SHANGHAI MUNICIPAL COUNCIL)

The durability of the block pavement is better shown by the fact that under heavy traffic the wear is only about 1-50 inch per year as compared to a wear of 1 inch on blue stone blocks under similar conditions.

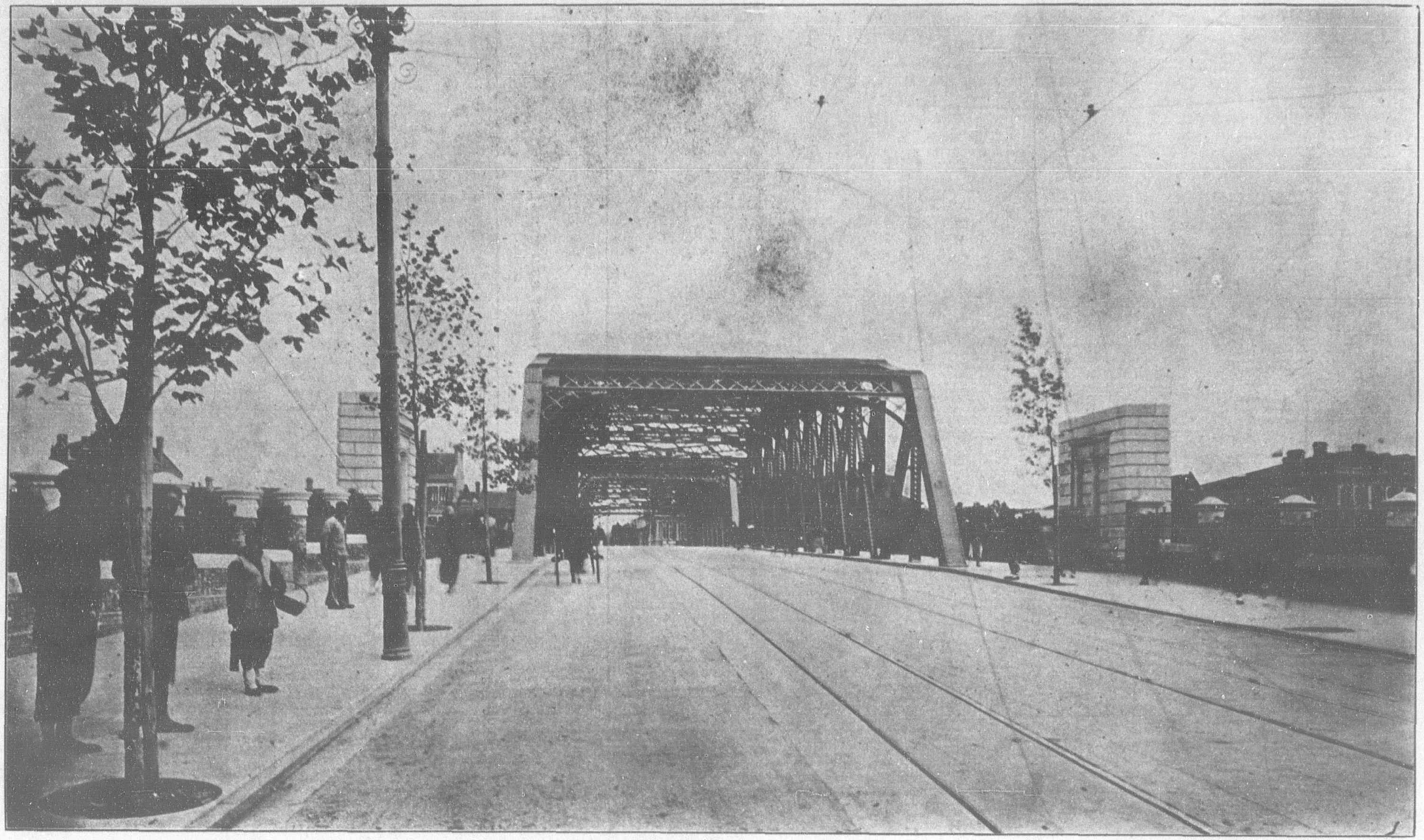
The life of such a pavement may be calculated at 16 years if proper care is exercised in the selection of the blocks and the manner of laying. This is an item that should be carefully considered by the Shanghai authorities, and compared with the cost of macadam especially on the main thoroughfares. While public information appears to be lacking as to the exact cost of construction and maintenance of the Shanghai macadam roads, the average annual cost of maintenance on such roads subjected to even light traffic is about 30% of the original cost, and in cases of extra heavy city traffic the annual maintenance charge has cost 30% more than the original cost of building, or in other words it has to be renewed every nine months.

As Mr. Mayne forcibly remarks in his Annual Report, "the day of the macadam with its continual maintenance is over in such streets as the Bund, Nanking Road, etc." The Council and ratepayers may stave it off from year to year but they have to come to it to the end, or else wilfully permit and acquiesce in the waste of public moneys for the upkeep of macadam roads which bear the burden of traffic in the heart of the Settlement. Owing to the use of inferior Tasmanian wood blocks, the wood pavements in Manila practically gave out after only three and one-half years of use, and the reputation of all Australian woods suffered as a consequence. With proper specification and careful inspection, however, this would not occur again, and Shanghai can profit from Manila's example.

The budget for 1909 calls for an estimated outlay of Tls. 262,712 for ordinary road expenses, and Tls. 250,000 for the purchase of land for new roads and improvements. In this item the sum of Tls. 70,000 is set aside for block paving Nanking Road between Kiangse and Chekiang Roads. This is a step in the right direction, as although the first cost is heavy, the wear and tear is less than any other style of road, and maintenance expenses are reduced to a minimum. The Department operates its own stone quarry at Ping Chiao, situated about 150 miles from Shanghai and which supplied about 50,000 tons of material in 1908. As a result of negotiations with the French Municipal Council to supply them with stone, the quarry plant was recently increased by addition of a 24"×16" Baxter crusher having a capacity of 16 tons per hour. There is another 16"×9" Baxter and a "Gates" crusher also in operation at the quarry.

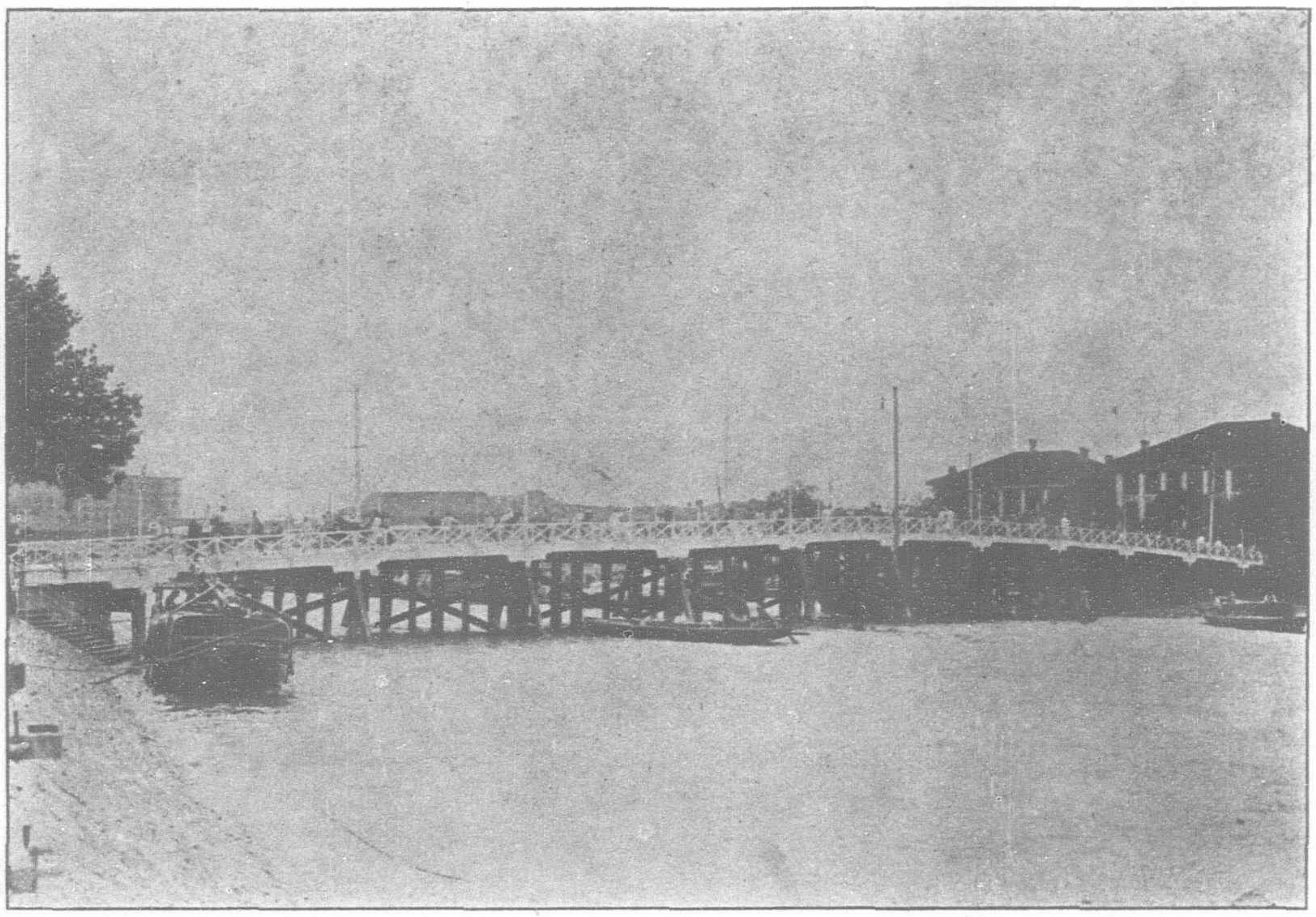
Concrete ware.—The department also operates its own concrete ware factory, inaugurated in 1890 to reduce the high cost of drainage works previously constructed with stoneware pipes from England, and also with a view to discourage the construction of private brick drains which became insanitary by reason of the permeability of the soft local brick. The plant is equipped with pipe and block making machinery, and last year turned out 38,994 pieces of which nearly half were made by machinery. The bulk of the work turned out are sewer and drainage pipes and fittings, while concrete and reinforced concrete steps, sills, lintels, copings, etc., are made for various municipal buildings under course of erection. All cement is tested at the municipal laboratory. The engineer points out in his report that in the various private yards no reliable tests are made, and without any idea of discouraging reputable local enterprises, warns the public against the use of concrete ware without first investigating the methods of fabrication and class of cement employed. He further states that with few exceptions Chinese contractors are woefully ignorant of the nature and properties of Portland Cement. The many firms which have recently been established for the manufacture of concrete building materials is an indication of the growing sentiment in favor of this form of construction. The temptation of the unscrupulous contractor or manufacturer of cement ware to use inferior quality or insufficient quantity of cement in his work is a strong one, as the average purchaser is incapable of distinguishing the difference. The time must come, when official inspection of the concrete ware in buildings will be as necessary as other time-honored building inspections. The employment of reinforced concrete beams, pillars, arches, floors, etc., in our public buildings, clubs and hotels, has already reached a stage which call for rigid inspection under the building regulations. While reputable architects and builders can be relied upon to honestly carry out work of this nature, there is no protection for the public against the unskilled or avaricious contractor who through ignorance or cupidity imperils life.

That the Shanghai authorities are keenly alive to this danger is evidenced by a scheme which has received official sanction for the registration of architects. An advisory committee, composed of several reputable architects and of which the Municipal Engineer is Chairman, enquires into and reports on the qualifications of the applicants, and on its decision the Council grants the authority for him to engage in work or otherwise.



SHANGHAI GARDEN BRIDGE SOUTH APPROACH.

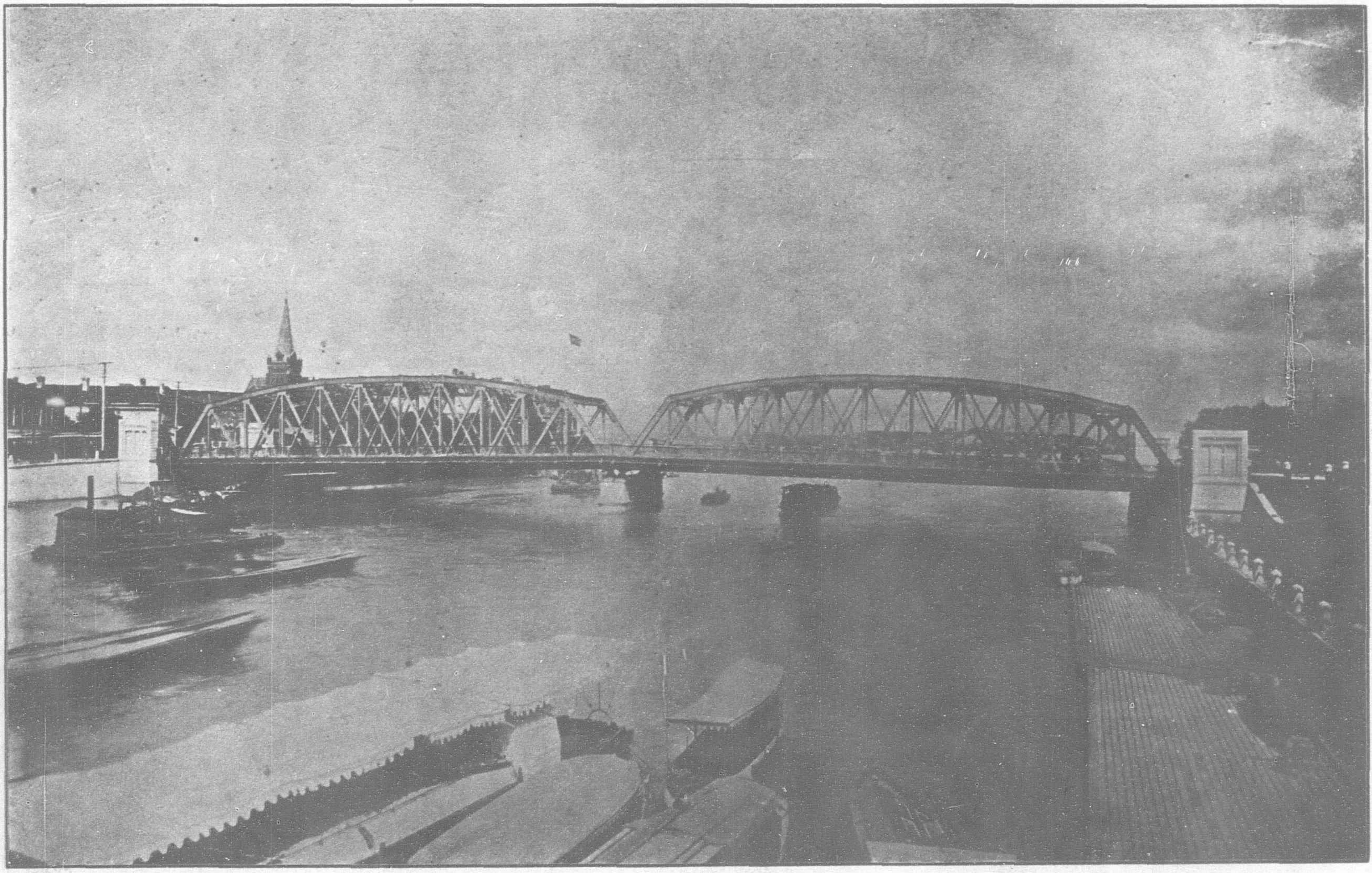
Built by *The Cleveland Bridge & Engineering Co., Ld.*, of Darlington, England. Erected by *Howarth, Erskine, Ld.*, of Singapore. A. H. Collinson, M. I. C. E., Consulting Engineer. C. Mayne, C. E., Municipal Engineer.



OLD GARDEN BRIDGE AT SHANGHAI.

Convict Labor.—Last year the Department to a large extent successfully employed convict labor on several important public works, and arrangements are being made to employ this labor in the concrete ware factory. An average number of 344 convicts has been daily employed, and the Engineer reports their conduct and diligence while at work as good, and the quality of work performed compares favorably with that done by local contractors. A length of 6,900 feet of road metalling was completed in 23 days, and a wall 1,310 feet long by 7 feet high was completed in two months. It is proposed to utilize convict labor to a greater extent in the future, which of course will result in a considerable saving in expenditure.

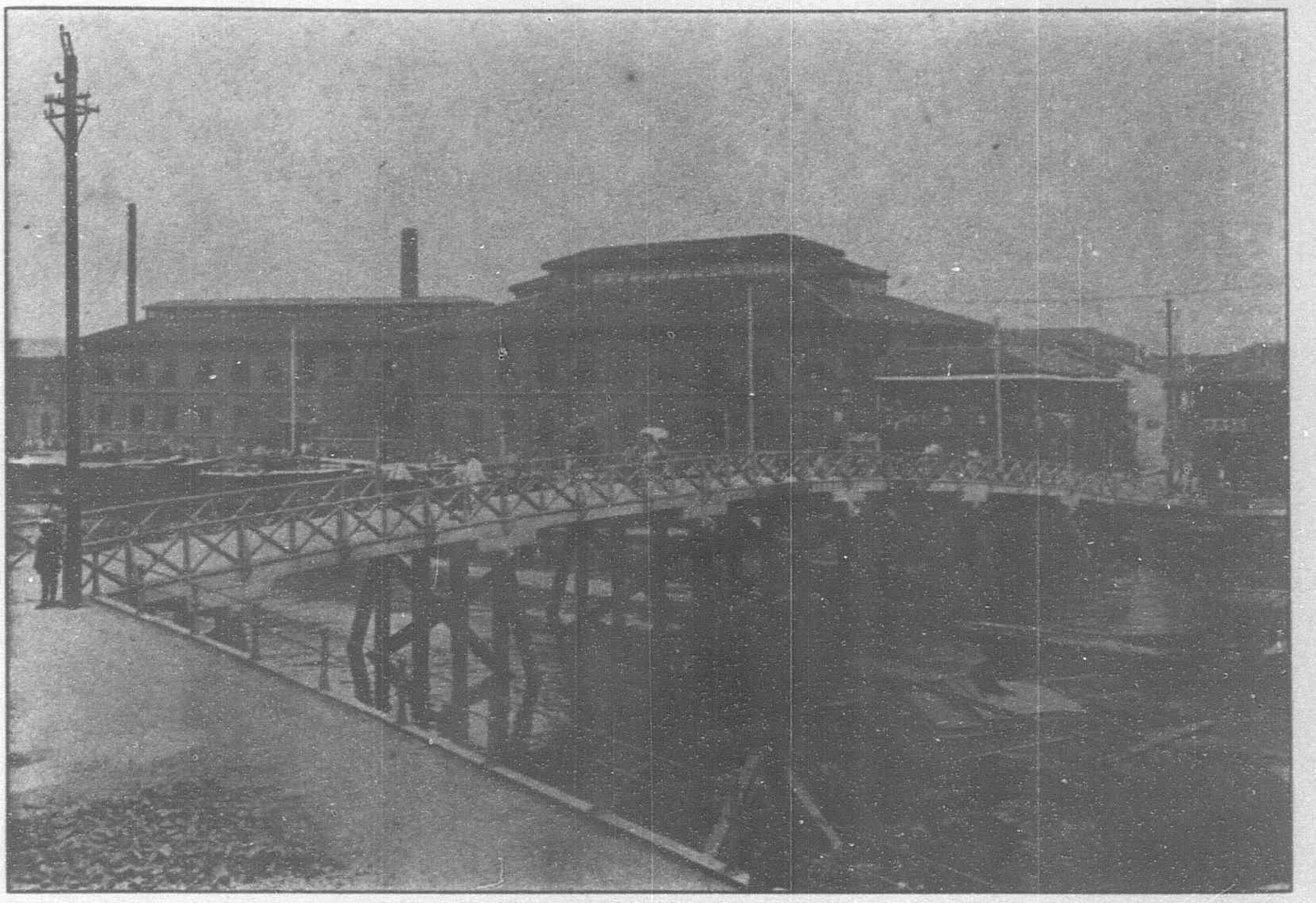
Bridges.—The number of bridges under control of the P.W.D. is 67. The majority of these are wooden structures across the numerous creeks and drains throughout the settlement. As far as possible the smaller bridges are being replaced by concrete arches and culverts and the larger and more important where the traffic is heaviest will be of steel. The Soochow creek, which divides the settlement, is a busy artery of junk and launch traffic, and the old wooden structures bridging the stream receive considerable damage from these craft. The traffic conditions on the bridges are rapidly changing as the settlement grows, and sooner or later these wooden structures will have to be replaced by steel. A good start has been made with the Garden and Chekiang Road bridges, which were fully described in our April issue. The Szechuen and Kiangse Road bridges are recommended for reconstruction in steel, but were not provided for in this



Erected by *Howarth, Erskine, Ld.*,
A. H. COLLINSON, M. I. C. E., Consulting Engineer.

GARDEN BRIDGE

Built by *Cleveland Bridge & Engineering Co., Ld.*
Darlington, England.
C. MAYNE, C. E., Municipal Engineer.



OLD CHEKIANG ROAD BRIDGE.

year's budget. Another scheme for which drawings and estimates have been prepared is the reconstruction of the Bund Bridge over the Yang King Pang creek, separating the International from the French Concession. At present the great traffic of the wide Bund is compressed in crossing this narrow bridge and the plan is to widen it to the same width as the Bund and make one broad and continuous thoroughfare.

The foreshore bunding constitutes an important item in the work of the Engineers' Department, in addition to dredging the Soochow creek and other drainage canals. A standard design of concrete bunding has been employed on the Soochow creek, but timber is still employed on account of lower cost.

Drainage.—The drainage system of Shanghai is confined to small outlets for the surface water.

Shanghai, like Manila and other low lying ports, presents many difficulties for the construction of a gravity sewer system. The Settlement, located on the Whangpoo River, 14 miles above its junction with the Yangtsze, has a normal rise and fall of the tide of about 11 feet. The water is fresh and highly charged with suspended matter, mostly of an alluvial nature. The nature of the country for miles around is very flat, consisting of a rich alluvial deposit, carried down by the Yangtsze. The general ground level of the Settlement is only about 2 feet above high water level. The city and surrounding country is intersected by numerous tidal creeks, which are utilized as far as possible as sewer outlets. From observations extending over a period of 20 years the mean average rainfall has been 43.60 inches and temperature Fh. 59.2 degrees.

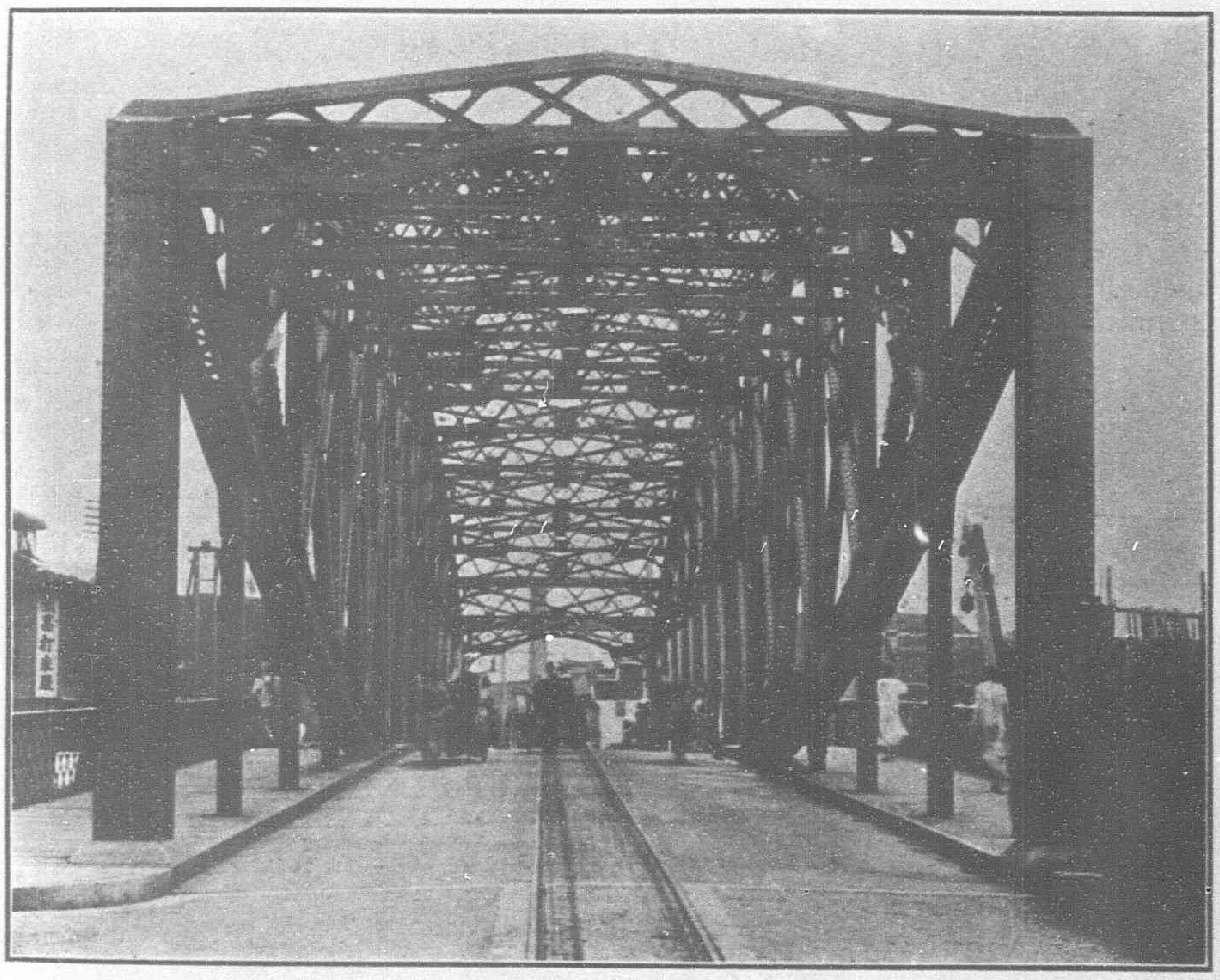
The solution of economical disposal of the ordure and night soil is found in the preference of the Chinese farmer for this class of fertilizer; the Council derives a revenue of Tls. 47,770 for the privilege of hauling it away, which is let to a native contractor. The latter provides all labor and covered receptacles for the collection and is under bond to convey it in covered boats to the rural districts without causing nuisance to the Settlement. The system works well and all the night soil is removed daily before 9 a. m.

Water closets are prohibited under the local regulations unless they empty into private cesspools which can be properly cleansed at regular intervals, but urinals and slop sinks are connected with the drainage sewers.

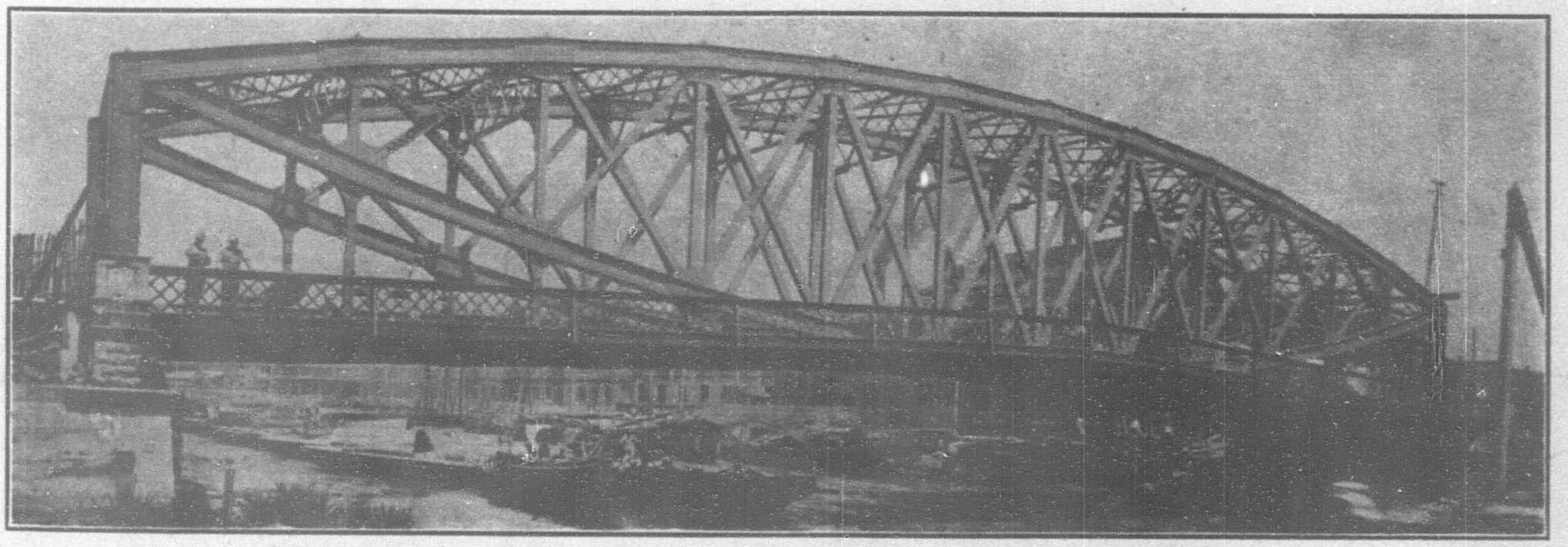
Owing to the numerous outlets provided by the many creeks, there are no large main fall sewers, the largest being 3'×2'. Tidal flap valves are not used and the tide is free to circulate through the sewers. Whenever possible dead ends are avoided in order that the tidal water may circulate freely through the various systems. As the majority of the roads are macadamized, a large amount of detritus is washed into the gullies which have to be cleaned out from time to time.

Rigid supervision is maintained over all private drainage works, and no drains are allowed to be covered until they have been inspected and approved by the Council's Inspectors.

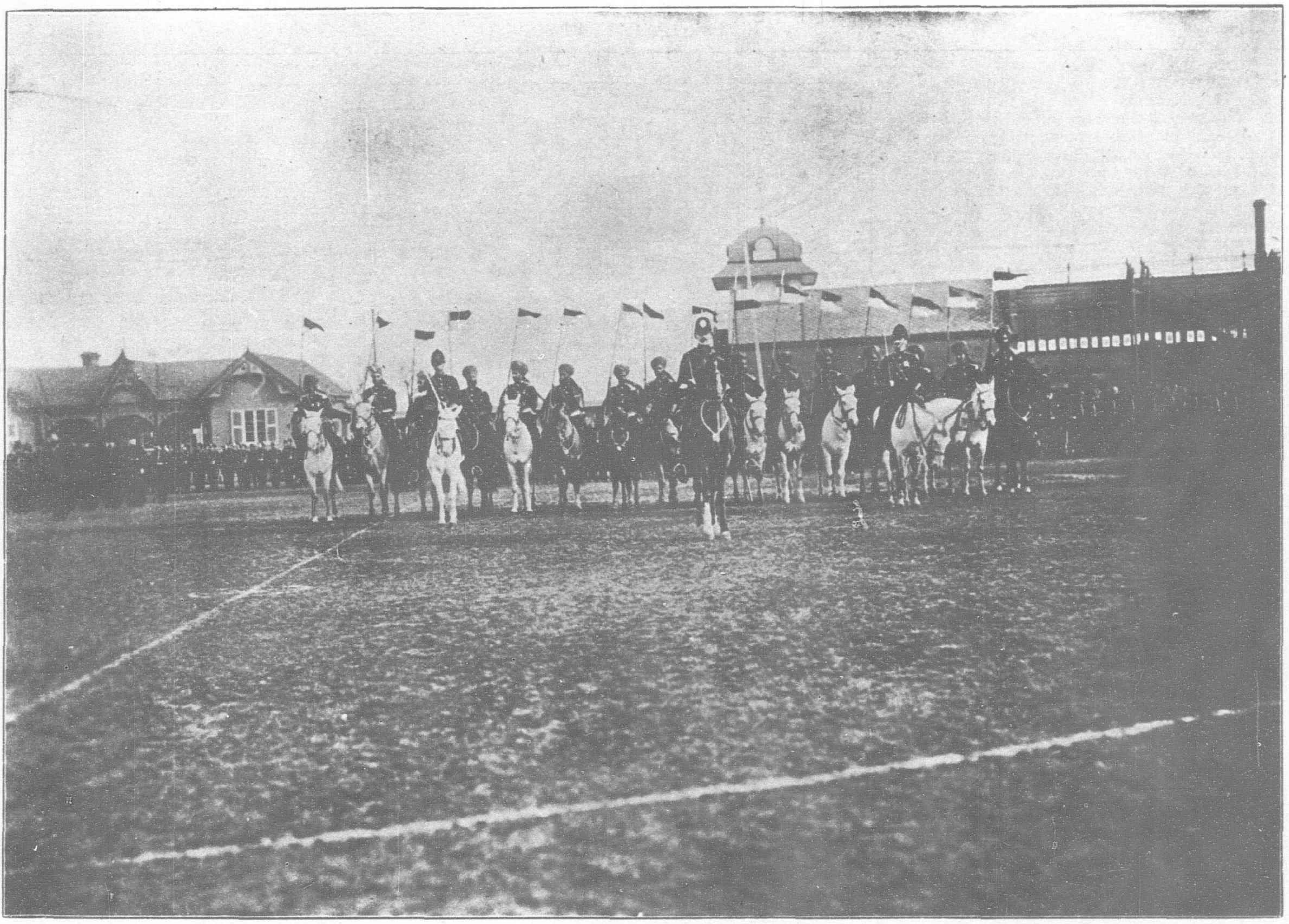
Owing to the difficulty of obtaining stoneware pipes at a reasonable cost, the Council in 1891



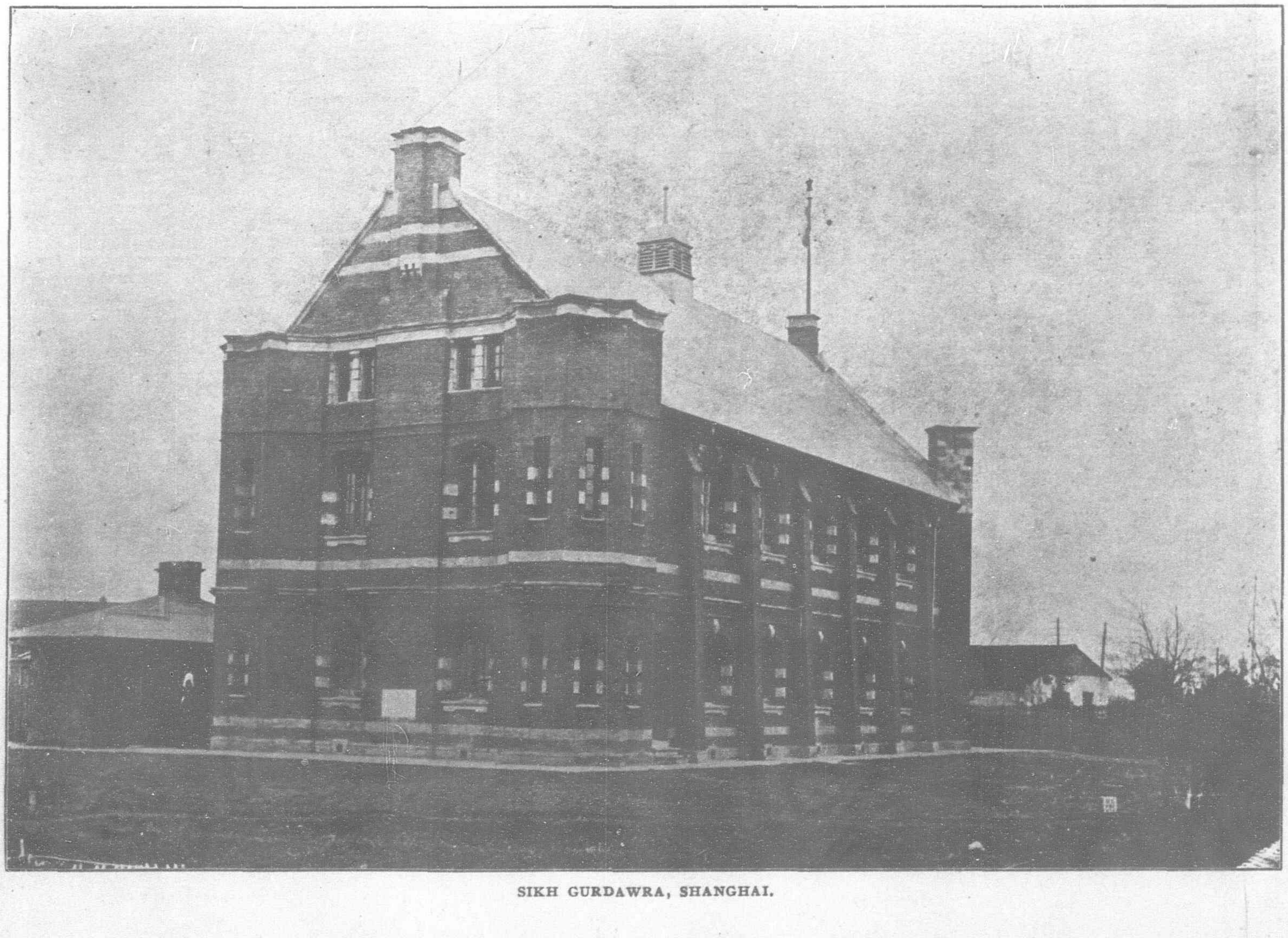
END VIEW OF THE CHEKIANG ROAD BRIDGE, SHANGHAI, BUILT BY CLEVELAND BRIDGE & ENGINEERING CO. LTD., ERECTED BY MESSRS. HOWARTH, ERSKINE, LTD.



SIDE VIEW OF THE CHEKIANG ROAD BRIDGE, SHANGHAI, BUILT BY CLEVELAND BRIDGE & ENGINEERING CO., LTD., ERECTED BY MESSRS. HOWARTH, ERSKINE, LTD.



SHANGHAI MUNICIPAL POLICE.—INDIAN TROOPERS.



SIKH GURDAWRA, SHANGHAI.

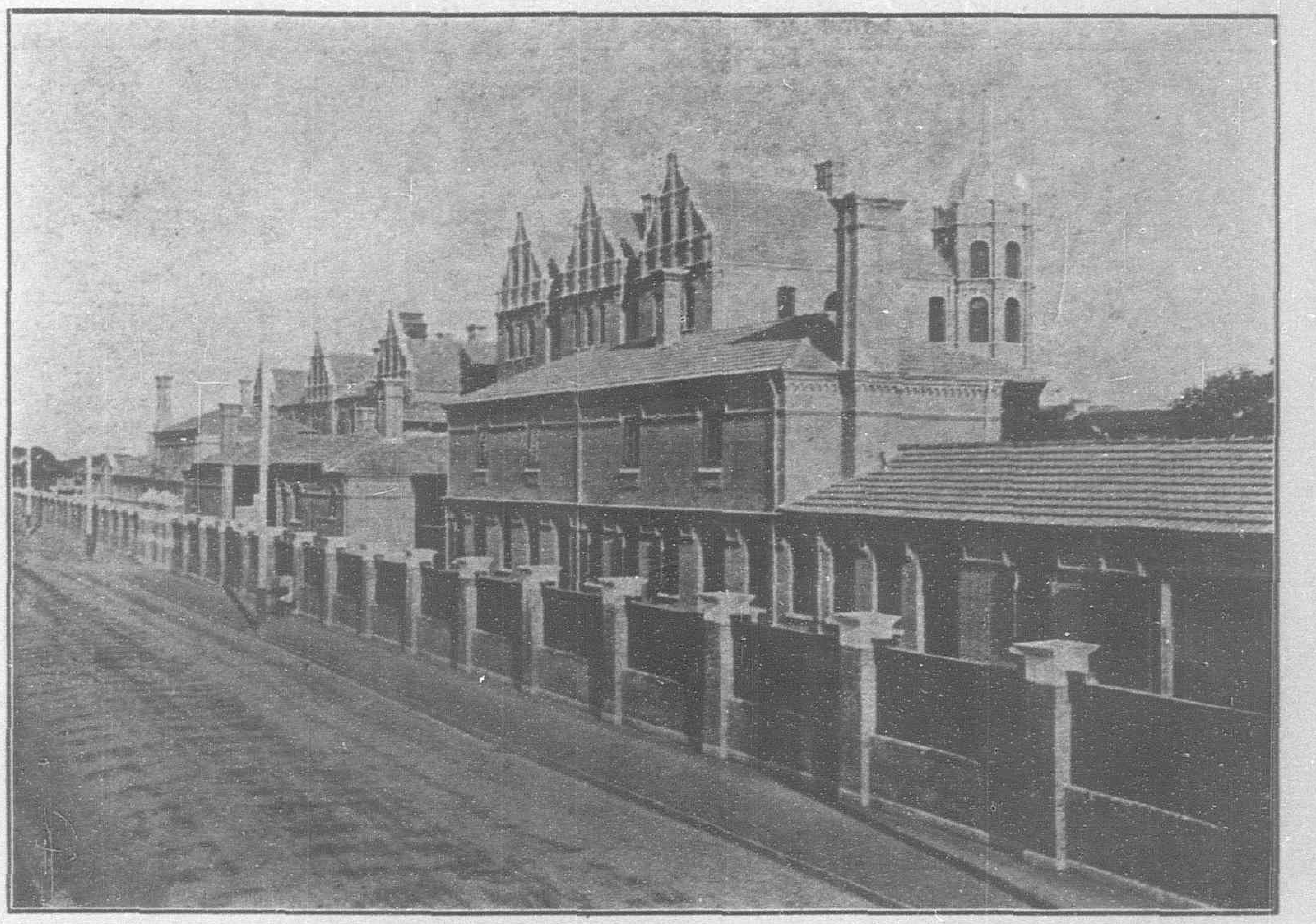
decided to manufacture its own pipes of concrete, and these pipes are used for all municipal work, and also supplied to private individuals. Within the last three or four years, all pipes up to 12" diameter have been made by machine, and compare favorably for porosity and durability with glazed stoneware pipes. They are made of the usual pattern in 2-feet lengths with spigot and socket joints. Other pipes of the following standard sizes are also manufactured:

Circular, 2' and 3' diameter.
Oval, 2'-3"×1'-6" and 3'×2'.

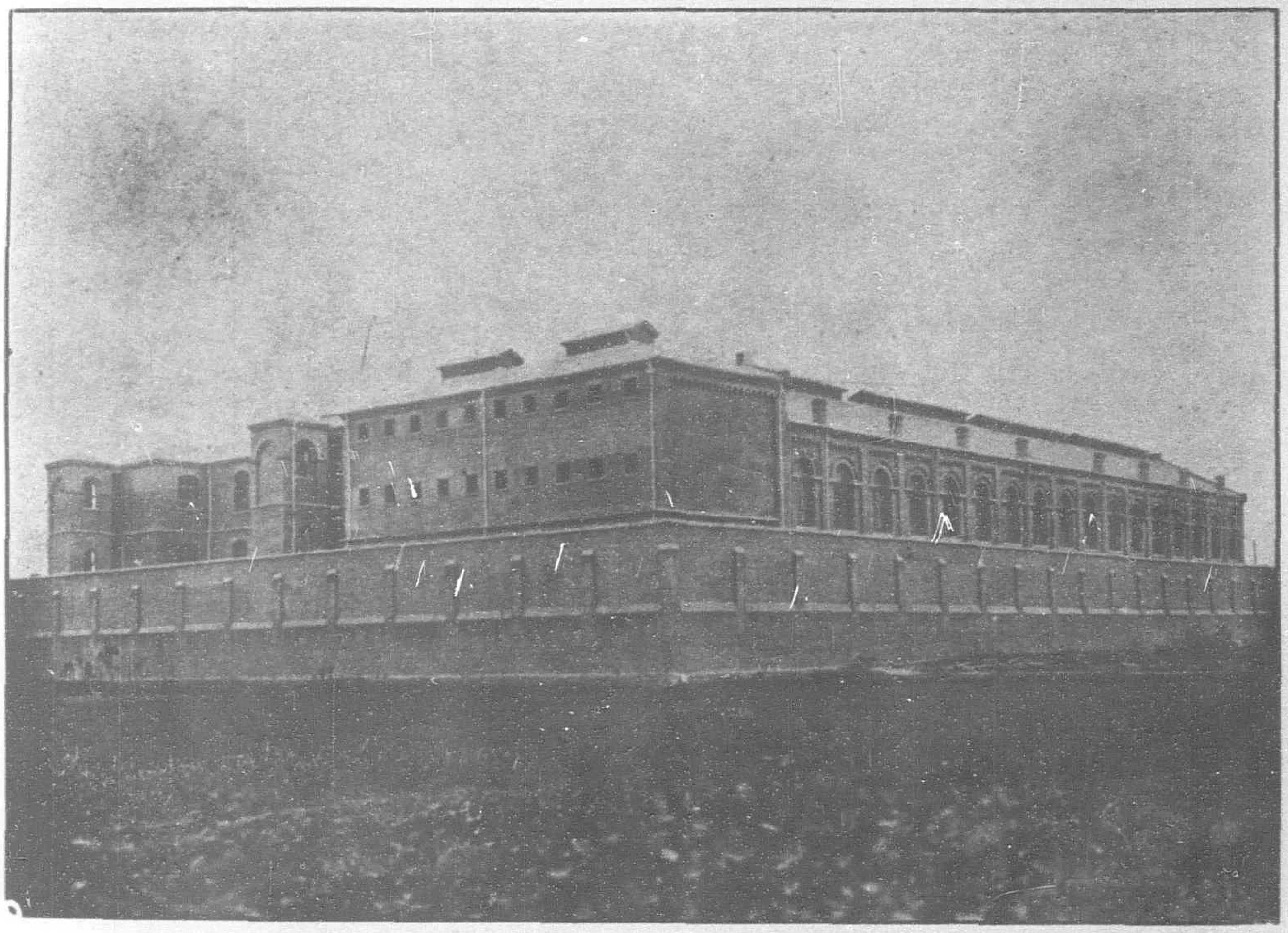
These are all reinforced by iron rods. Street gullies of the usual pot form are also made.

Wherever new roads are made through country districts, where the rateable value does not justify the laying of a sewer, the drainage is affected by means of a ditch, 10 feet wide on the top and 6 feet deep, cut on one side of the road. When such districts get built up, these ditches are filled in and sewers laid in the ordinary manner.

Buildings.—The public buildings of Shanghai, under control of the Municipality include the Town Hall, erected at a cost of Tls. 132,000 Public Markets Tls. 134,000, Central Police Station Tls. 83,000, Louza Police Station Tls. 42,000, Bubbling Well Police Station Tls. 27,000, Sinza Police Station Tls. 40,000, Gaol Tls. 178,000, Fire Station Tls. 28,000, Victoria Nursing Home Tls. 114,000, Isolation Hospital Tls. 163,000, Isolation Hospital for Chinese Tls. 22,000, Public Swimming Bath, Tls. 17,000, Slaughter Houses Tls. 19,000, Cattle Sheds Tls. 20,000, Crematorium Tls. 51,000, Chinese Public School Tls. 54,000, Electricity works Buildings Tls. 188,000.



SHANGHAI MUNICIPAL HOSPITAL, (NORTH FRONT)



SHANGHAI MUNICIPAL GAOL.

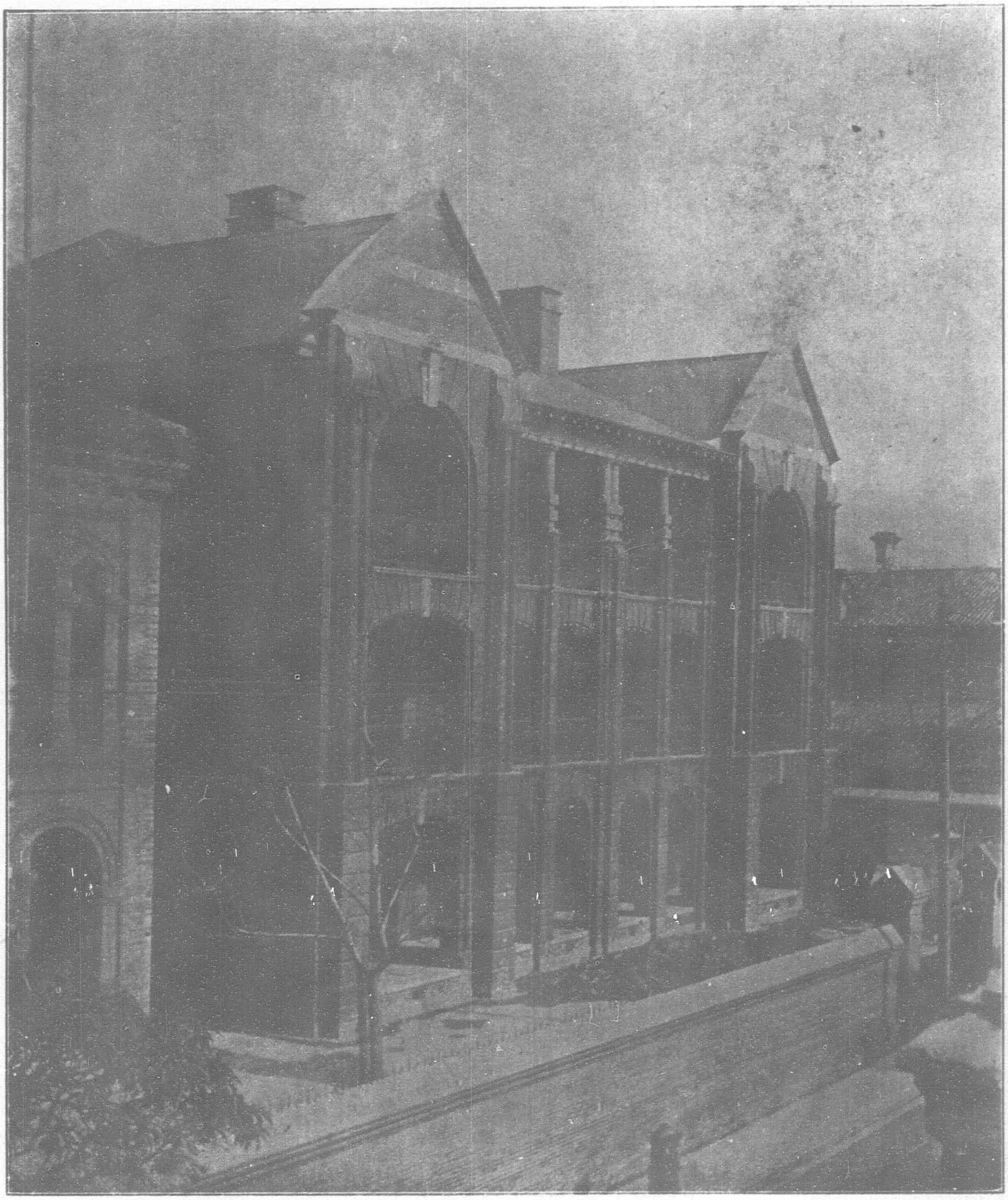
New Police Stations have been erected during the past year, and several new buildings are projected for the current year in which will be included a new electrical plant at the Point.

Many new private buildings are in course of erection throughout the city which will greatly add to its attractiveness, amongst which may be mentioned the Burlington Hotel, Jardine Matheson & Co.'s offices on Peking Road, China Mutual Life Insurance Co.'s new premises on Canton Road, British American Tobacco Co. on Soochow Road, Arnhold, Karberg & Co.'s office building of reinforced concrete construction, Palace Hotel, Ningpo Commercial Bank, Branch of the Hongkong and Shanghai Bank in Hongkew, the Telephone Building and others. Some of the principal buildings under construction at present are the New Astor House Hotel, the Ta Ching Government Bank and the new Shanghai Club. Over three thousand new buildings were erected last year of which the greater proportion 2,720 were native and 105 foreign buildings.

The inspection of boilers is also under the P. W. D., a total of 172 being inspected during the year.

Water Supply.—The water supply of the city is derived from the Shanghai Waterworks Co., Ltd., who supplied the Municipality with over 115,000,000 gallons during the year. The city holds 1,950 shares of the water company out of a total of 16,350, producing a revenue in 1907 of £3,310, and an estimated revenue of £5,000 for the present year.

SHANGHAI MUNICIPAL HOSPITAL, (SOUTH FRONT)



HONGKEW POLICE STATION.—SHANGHAI.

The Waterworks company is a British Corporation registered in London, and established in 1881, with an original capital of £100,000. This has been increased from time to time until it is now £327,000 divided into 16,350 shares of £20 each fully paid up. The company has a reserve of Tls. 190,000, and last year paid a dividend of 30 shillings per share. The financial report of the company was published in full in the April issue of the FAR EASTERN REVIEW.

The water is taken from the Whangpoo River at high tide, by gravitation and pumping, whence it passes into large settling reservoirs having an aggregate capacity of 20,000,000 gallons. After proper settling the water is then pumped into the service reservoirs, which are raised about 10 feet, and from there it flows by gravity to the filter beds. There are 16 filter beds. The water then flows into the two pure water covered-in reservoirs from whence it is distributed to service mains for distribution.

The pumping plant consists of three horizontal compound, and one differential pumping engine, the last from Messrs. Hathorn, Davey & Co., while a contract has recently been placed with Messrs. Glenfield, Kennedy Co., Ltd., for a new pumping engine with a capacity of 300,000 gallons per hour. The station has its own electrical plant. The four boilers are of the Lancashire type.

The water is pumped through two mains of 20″ and 25″ to water towers, one, the oldest located in the Kiangse Road having a height of 100 feet, and the second and newest of 125 feet in height located in the Sinza district. The towers regulate the pressure, and have a combined capacity of about 300,000 gallons.

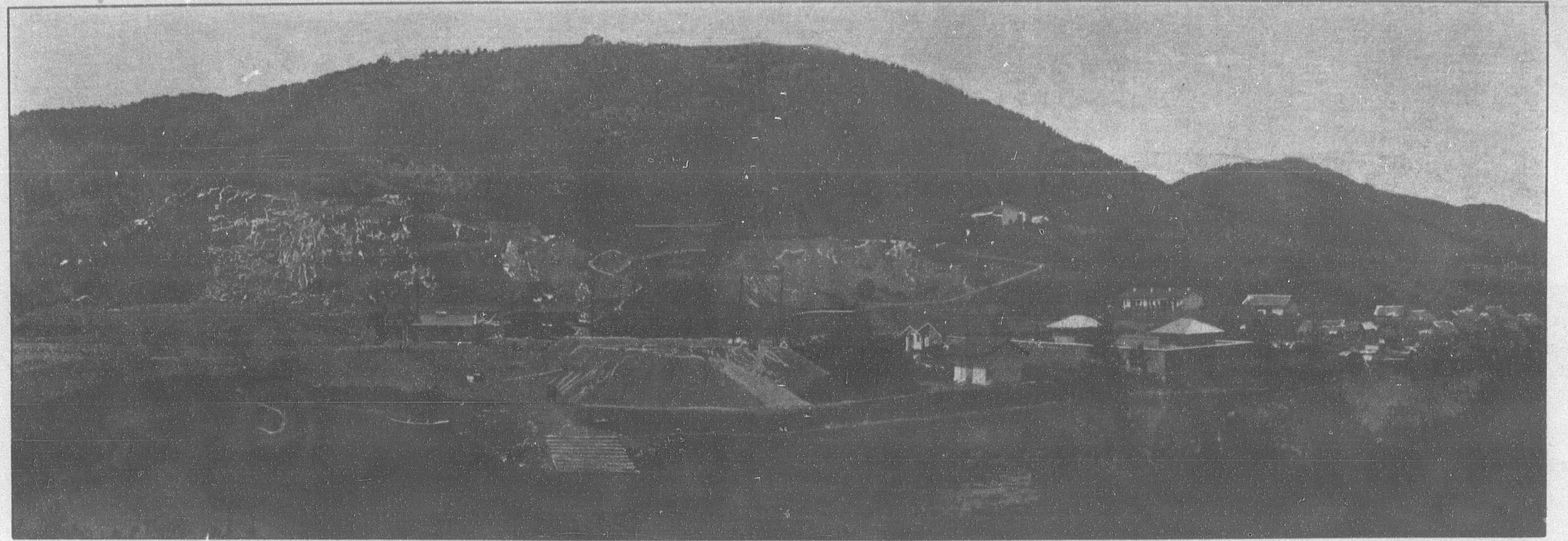
The charge for domestic purposes is 4 per cent on the annual rental to foreigners and 5 per cent for natives. For industrial purposes the charges are 40 cents (Mexican) per 1,000 gallons for quantities from 10,000 to 200,000 gallons, 35 cents per M. up to 300,000 gallons, and 30 cents per M. for greater quantities.

The present consumption of the Settlement averages about 7,000,000 gallons per day, and the capacity of the plant is 16,750,000 gallons; with the addition of the new pumping engine this will be increased to 24,000,000 gallons, or an ample reserve power to meet all the demands of the rapidly growing settlement. There are over 80 miles of mains, and about 700 fire hydrants. The financial condition of the company is excellent, their shares being quoted on the Shanghai Exchange at Tls. 437, or over 150 per cent above par.

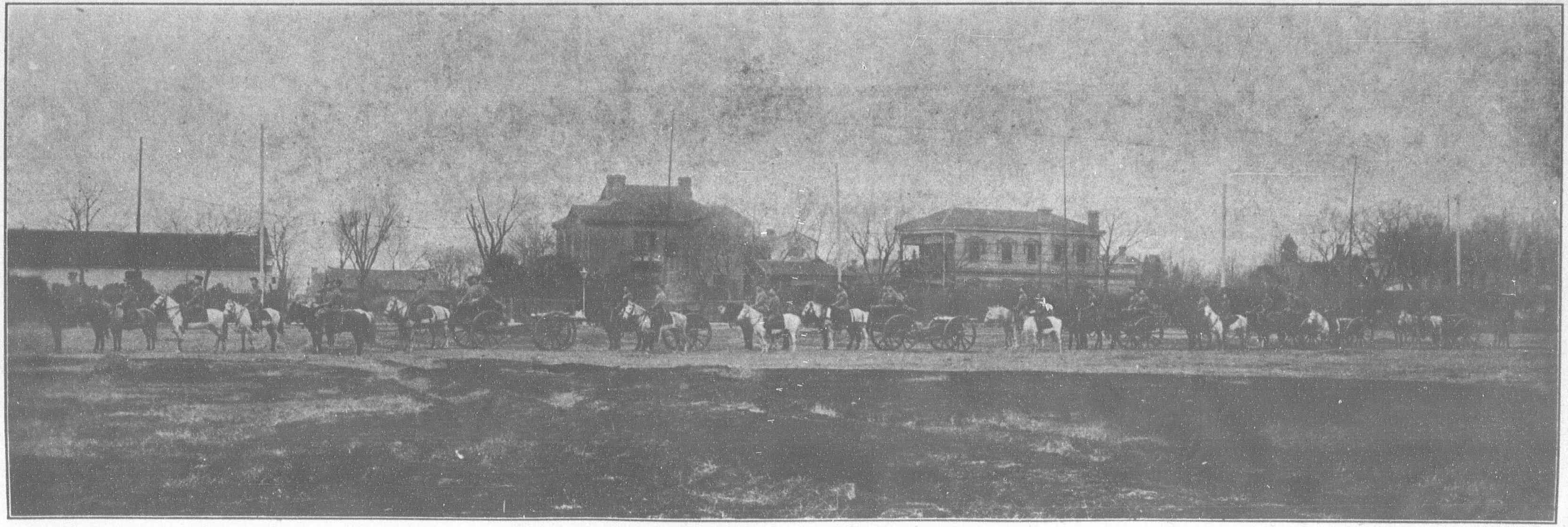
There are several existing bond issues aggregating Tls. 750,000 which it is proposed to redeem by a new issue of Tls. 1,500,000 in instalments as required.

The number of foreign houses supplied with water is 1,905 and native houses 40,869 in addition to which must be added the supply to the Municipal Council, mills, factories, etc. The great waste of water by the natives had led the Company to consider the matter of charging by quantity and affixing a meter to each house.

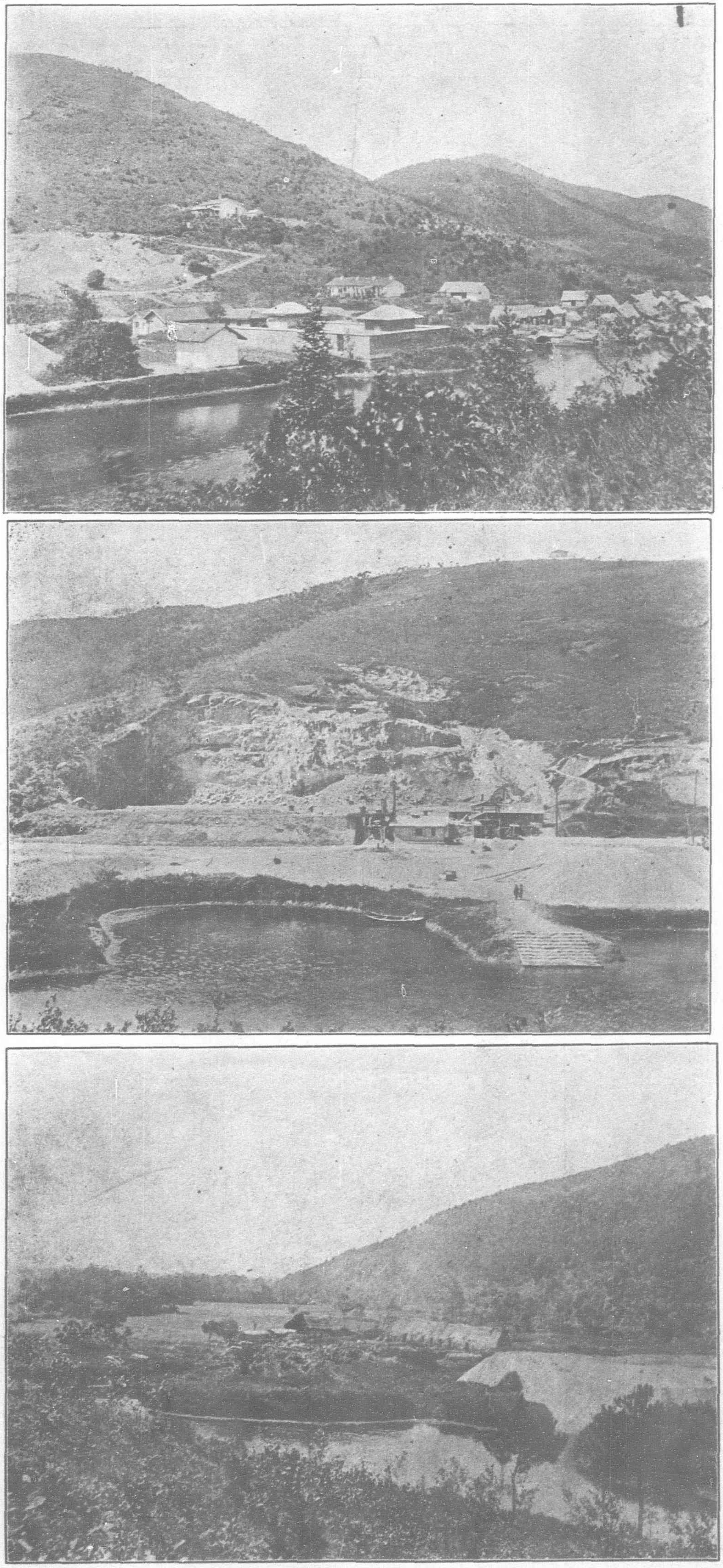
In addition to the ordinary pipe fitting business for connecting the mains to houses, the company has recently established an up to date plumbing branch. The many new foreign edifices, both office buildings and dwellings, have been erected with all modern conveniences. With the sole exception of the closet, nearly all



GENERAL VIEW OF THE PINGCHIAO QUARRY OF THE SHANGHAI PUBLIC WORKS DEPARTMENT.



SHANGHAI VOLUNTEER ARTILLERY.



THREE VIEWS OF THE PINGCHIAO QUARRY.

new houses are being fitted with porcelain bath tubs, wash stands, sinks, and hot water boilers, and where houses have their own properly constituted cesspools, the flush closets are also installed. All the older foreign built and all the native built houses were formerly fitted with water connections only, and each tenant had to supply his own bath tub sink, stove, etc. The demand for something better than the Soochow bath tub and sanitary fittings has, however, opened the way for a profitable business in modern plumbing and sanitary fixtures. The Waterworks and the firm of Gordon & Co. carry large stocks of material, and are prepared to execute any work of this nature.

The quality of the water is excellent, as may be seen from the following analysis by the Health Officer:

Sample received, 25th November, 1905.

Report sent out, 30th November, 1905.

Sample.—Shanghai Waterworks Co.'s water.

Physical Characters.—Pale yellowish green color with slight opacity.

	Parts per 10,000
Solid matters in Solution	15.0
(a) Volatile	7.0
(b) Fixed	8.0
Appearance on ignition, slight charring.	
Total hardness	11.0
(a) Temporary	5.0
(b) Permanent	6.0
Chlorine	2.7
Nitrogen as Nitrates	0.03
Saline Ammonia	0.02
Albuminoid Ammonia	0.015
Poisonous Metals	Nil.
Nitrates	Nil.
Phosphates	Nil.
Sulphates	Traces.

Bacteriological Examination.—Nutrient gelatine plates incubated at 23° C showed 200 micro-organisms per cubic centimetre. The ratio of liquefying to non-liquefying organisms was one to ten.

Agar plates incubated at blood heat yielded 40 microbes per cubic centimetre.

Report on Analysis.—A sample of well filtered water showing a high degree of chemical and bacteriological purity.

The French Municipality have their own Waterworks completed in 1902, at a cost of Tls. 350,000. The present supply is not equal to the demand, and the plant located at Tunkadoo will be enlarged, and another water tower erected. The water is taken from the Whangpoo River, and is settled and filtered before delivery to the tower. The waterworks were taken over from the French Municipal authorities last year by the French Tramways & Lighting Co. The charge per cubic meter is Tls. 07 to ordinary consumers.

There is also a native City Waterworks with plant at Kiangnan for supplying the Chinese City.

Gas.—The public lighting of Shanghai is controlled by the Municipal authorities, but the older established gas company still does a large and increasing business despite this severe competition. Gas was first introduced in the settlement in 1865, and the original plant located in Hankow Road, but shortly afterwards the works were removed to their present location in Tibet Road. The plant is equipped with the best modern machinery with a capacity of 3,000,000 cubic feet per day, and supplied nearly 500,000,000 feet of gas in 1907, while in 1908 the consumption was increased some 30,000,000 feet, distributed to over 8,000 consumers.

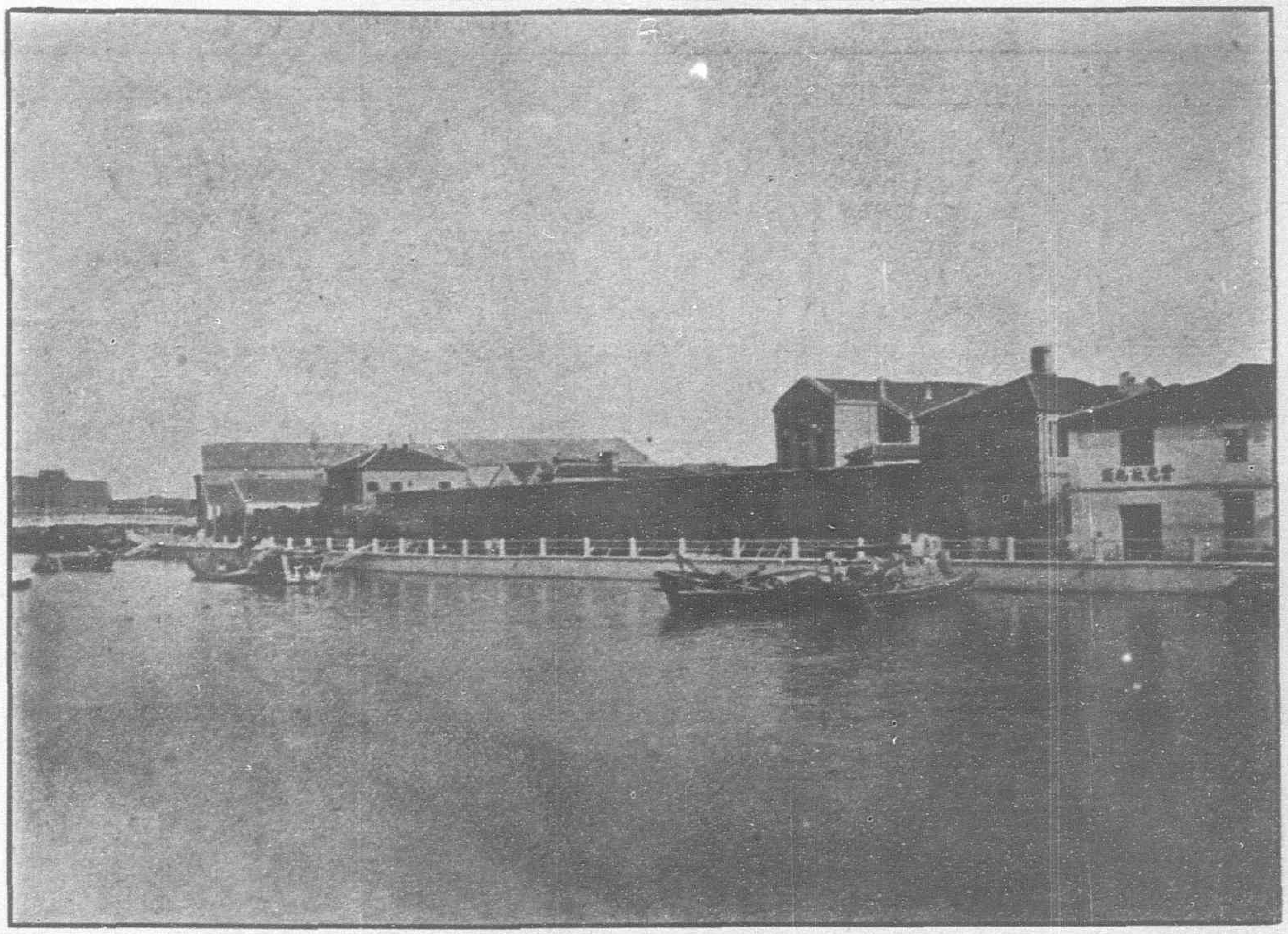
The consumption has been trebled in eight years, and the growth of the settlement must again call for further increase making the works one of the largest outside of Europe, or America, and at the same time one of the most profitable.

The charges to consumers have steadily declined until at present it is about $1.70 Mexican silver per M feet, or approximately 70 gold cents. The Municipality receives a discount of 25% on the cost of public lighting, amounting last year to Tls. 6,000. At the present prices of coal delivered in Shanghai, this rate is remarkably low compared with charges in other parts of the world, but even at this low rate, a handsome profit is made, and the company is in a flourishing financial condition.

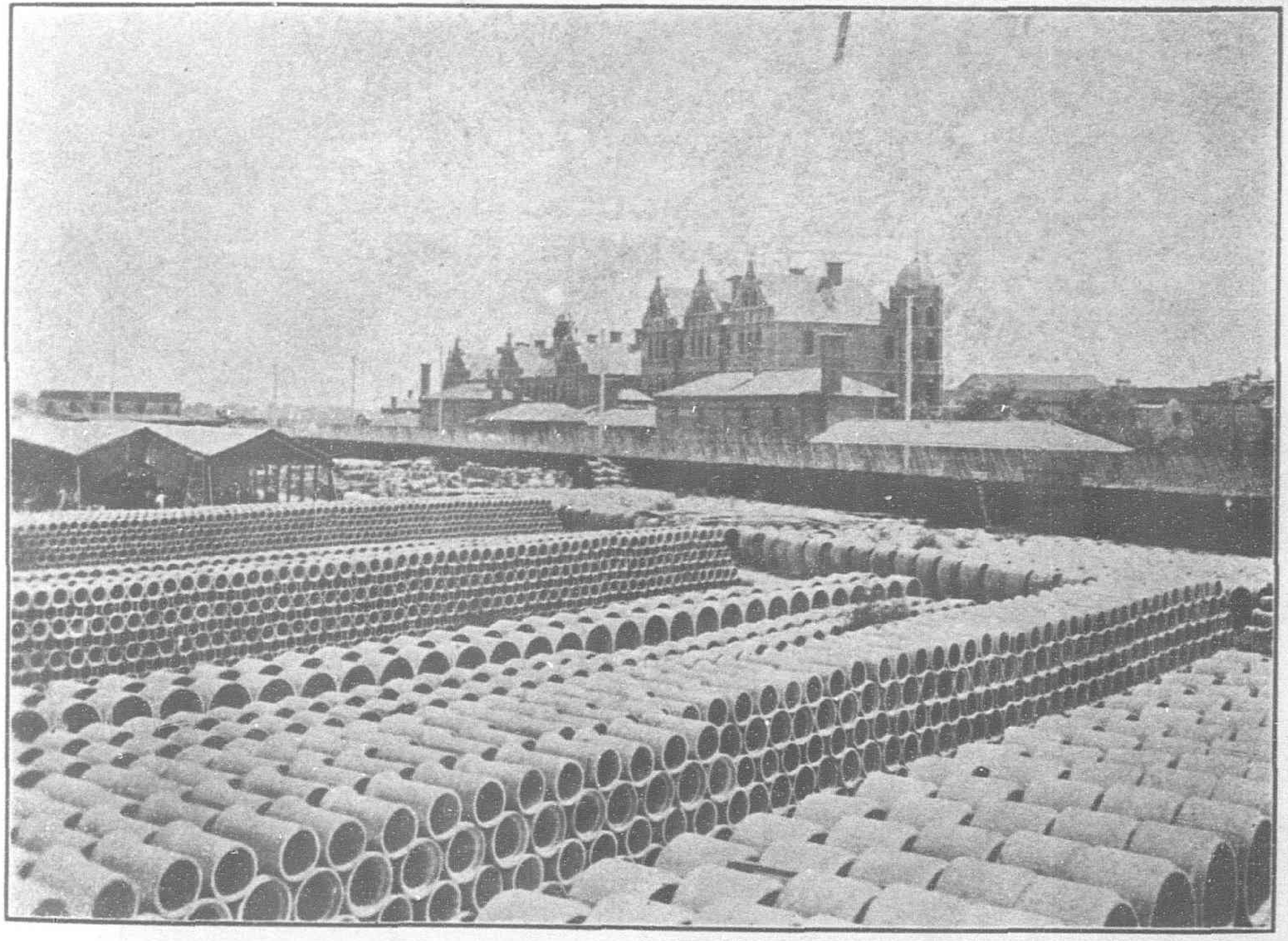
In 1901 the Company was registered under the laws of Hongkong with a capital of Tls. 400,000, which was subsequently increased to Tls. 800,000 and again to Tls. 1,200,000 divided into 24,000 shares of Tls. 50 each all paid up. The last interim dividend declared was 6% or a total of 13% for the year. The shares are listed on the market at Tls. 115 bid, with no sellers, or 130% above par.

The last Annual Report of the Company was published in full in the April issue of the FAR EASTERN REVIEW.

The Company have issued three loans and it is now proposed to create a new loan of Tls. 1,250,000 of which Tls. 400,000 are to be applied to the redemption of outstanding issues and the sum of Tls. 400,000 to be issued as required. There are 113 gas engines in operation in the Settlement. The sales residuals, coke, tar, pitch and sulphate of ammonia are affected with a good profit.



CONCRETE BUNDING ON SOOCHOW CREEK.



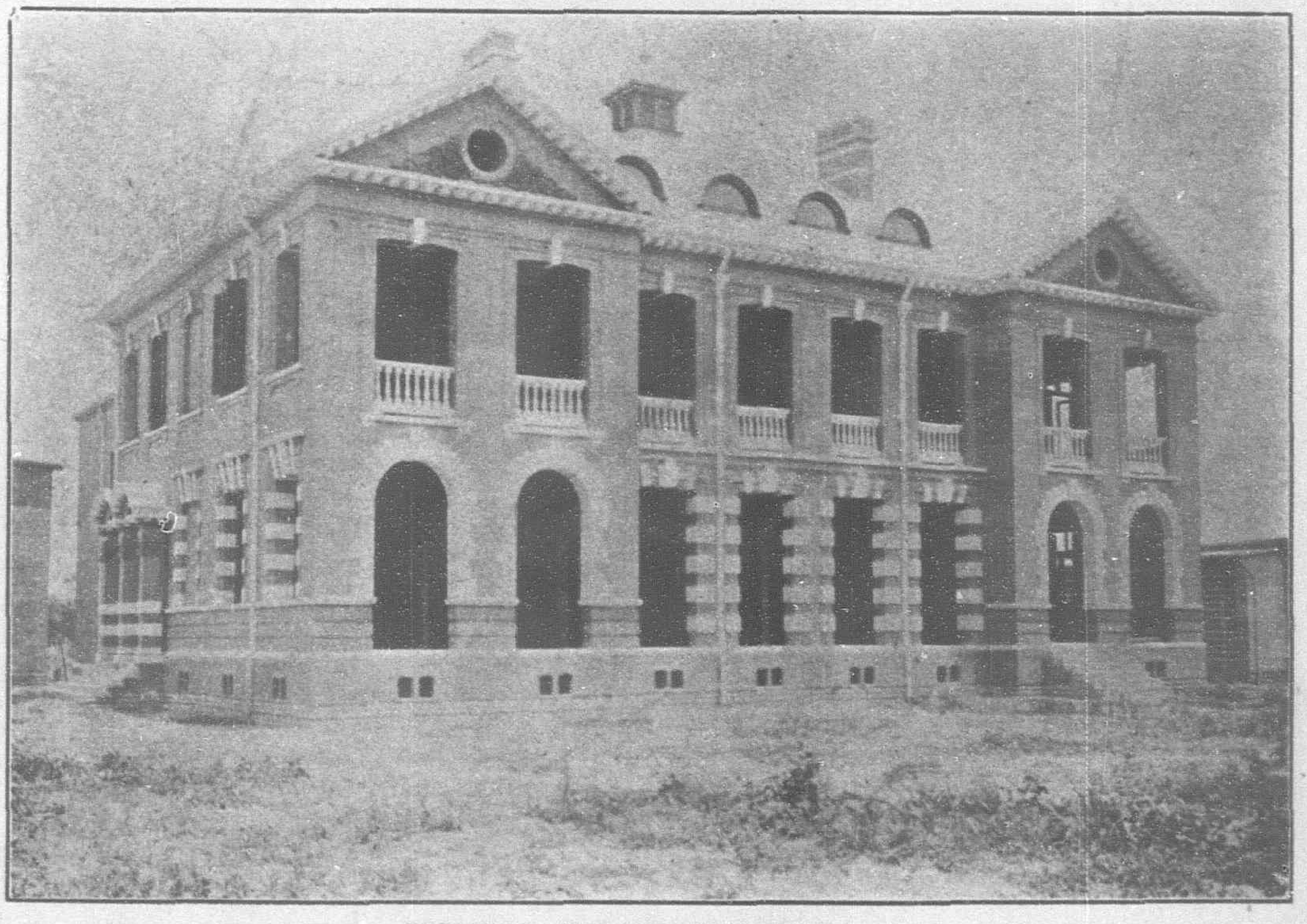
CONCRETE WARE FACTORY.

The company act as agents for the well known Crossby gas engine, and in addition carry a full line of gas and electroliers, Welsbach lights and burners, and other requisites for the use of gas.

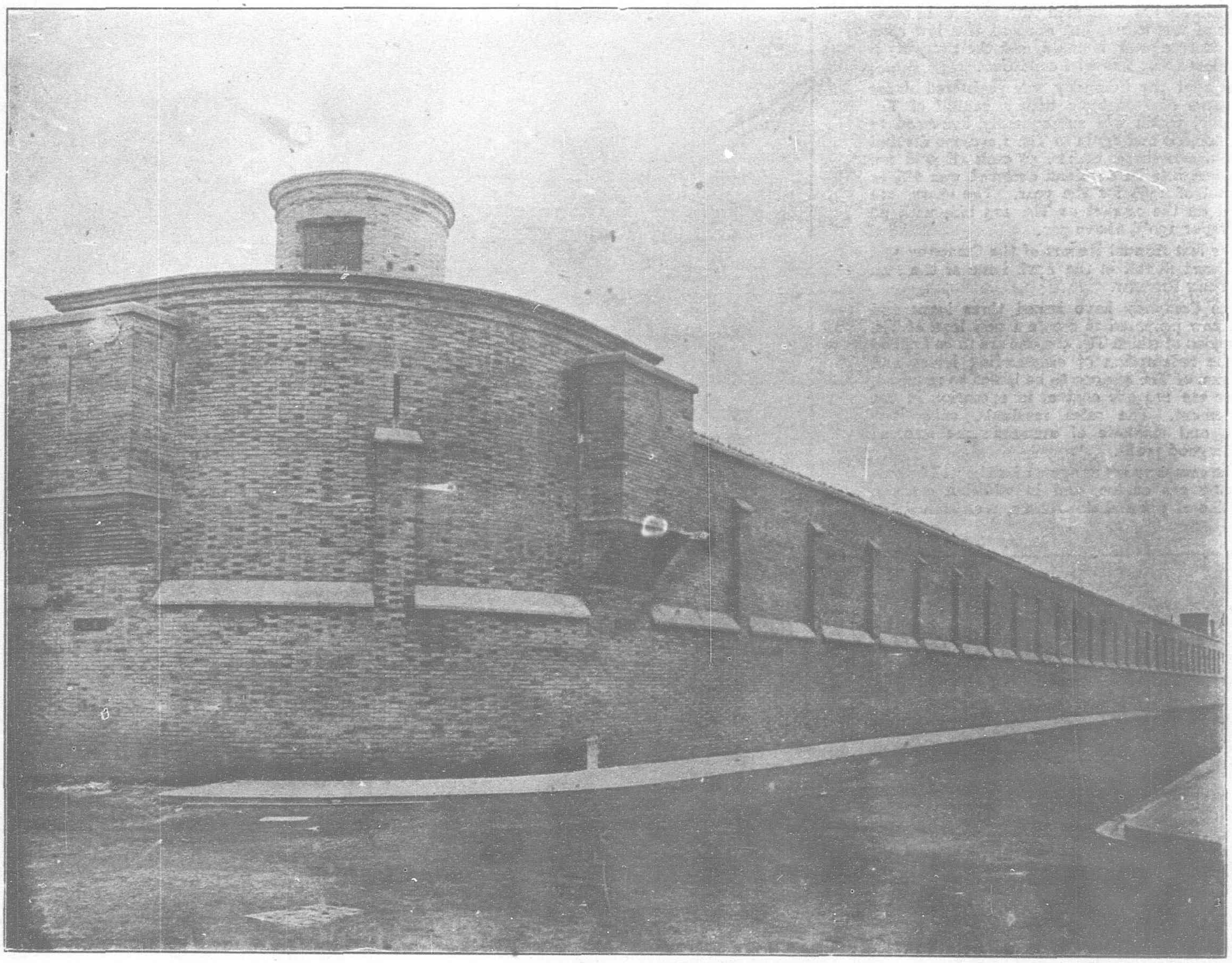
Telephones.—The telephone service in Shanghai is controlled by the Shanghai Mutual Telephone Co., Ltd., a British corporation registered under the Hongkong Ordinances. The service was carried on from 1881 to 1898 by the China and Japan Telephone Company, working under a charter revocable at 12 months' notice. The arrangement was so unsatisfactory that the Company applied for a definite extension of the Charter for a term of years, which led the Municipal Council to call for public tenders to supply the settlement with a service that would fulfill the requirements of the growing port. The privilege was granted to a new company formed largely of local stockholders, who offered to give a good up-to-date service, without any special franchise, relying on the good faith of the community to support their efforts. On this basis the Shanghai Mutual Telephone Co. was organized with a capital of Tls. 100,000 and compromised to complete their installation by April 1901, but several months before this, they were ready for operation and in another year the plant had reached its capacity of 600 subscribers. The capital was then increased to Tls. 350,000 to provide for an enlargement of the exchange to 2,500 subscribers, and in 1905 it was again necessary to extend the service for 5,000 subscribers.

The Automatic Telephone Company's agent about this time made a strenuous effort to secure a franchise from the Council, on the strength of the superiority of their system over the present one, but the Council and public gave their support to the company who had entered the field, relying on their sense of fair play. The company was subsequently granted a 30 years' lease in exchange for 1,000 fully paid up shares, which paid into the Municipal treasury last year a dividend of 6% equal to Tls. 3,000. The capital of the Company is now Tls. 675,000 in 13,500 shares of Tls 50, par value each fully paid up. A dividend of 6% was paid last year, and the shares are quoted at 57 or 7 points above par.

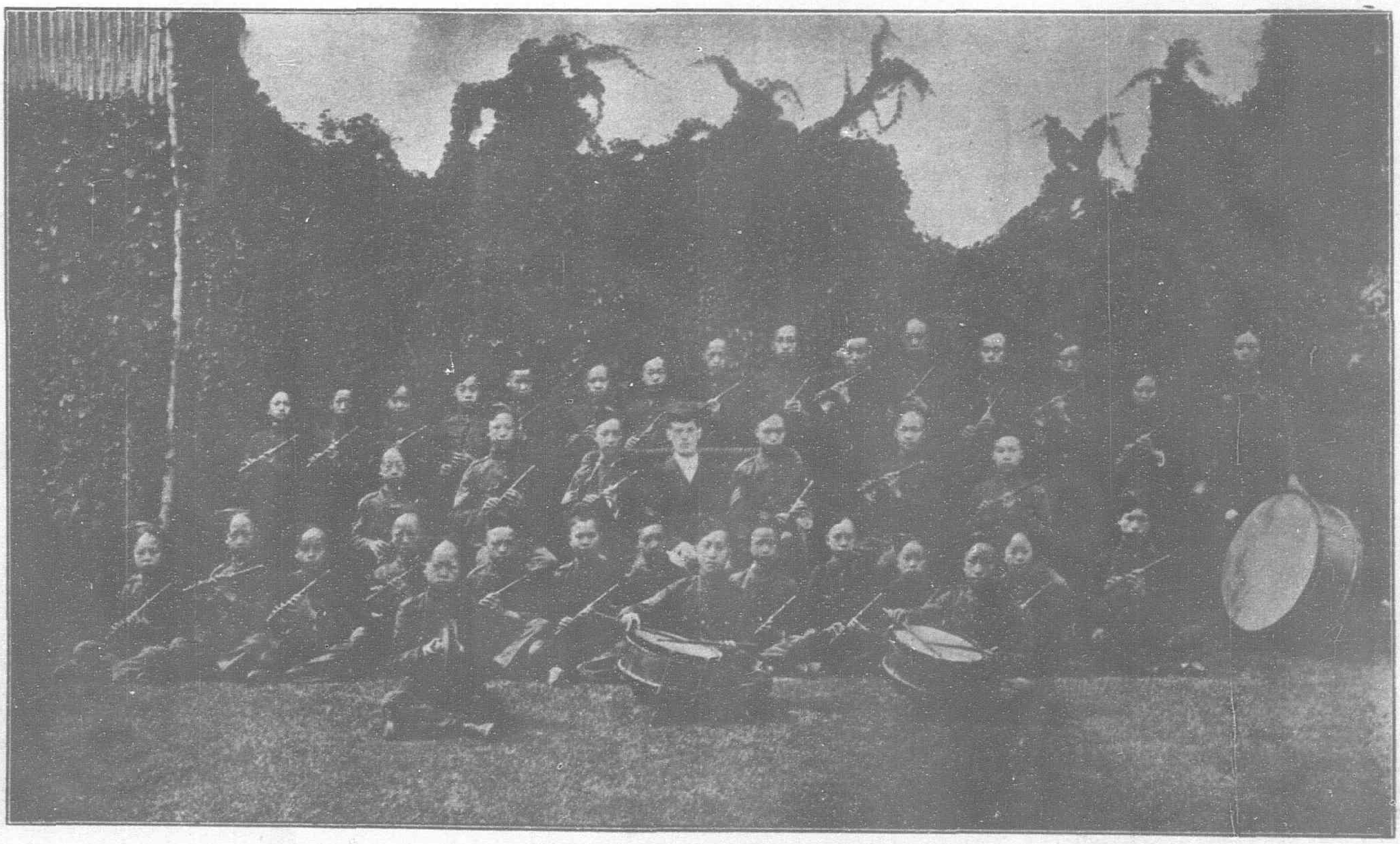
There are about 4,500 subscribers at present. The new edifice, located on Kiangse corner of Hankow, is probably the finest type of modern office building in the Settlement, and the two top floors are taken over for the operation of the plant, which is capable of dealing with 5,000 subscribers. The plant is to be still further enlarged in the near future.



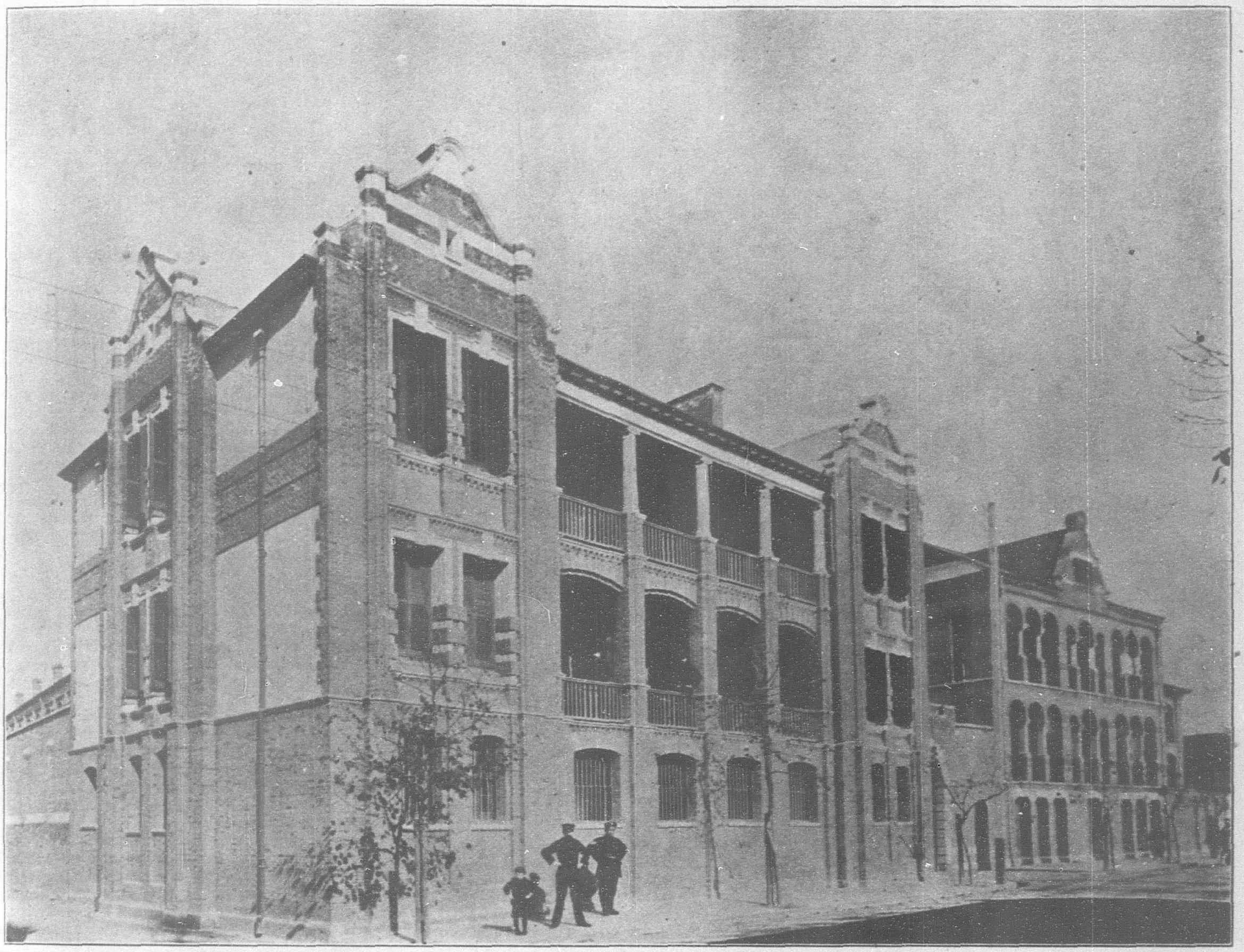
BUBBLING WELL POLICE STATION.



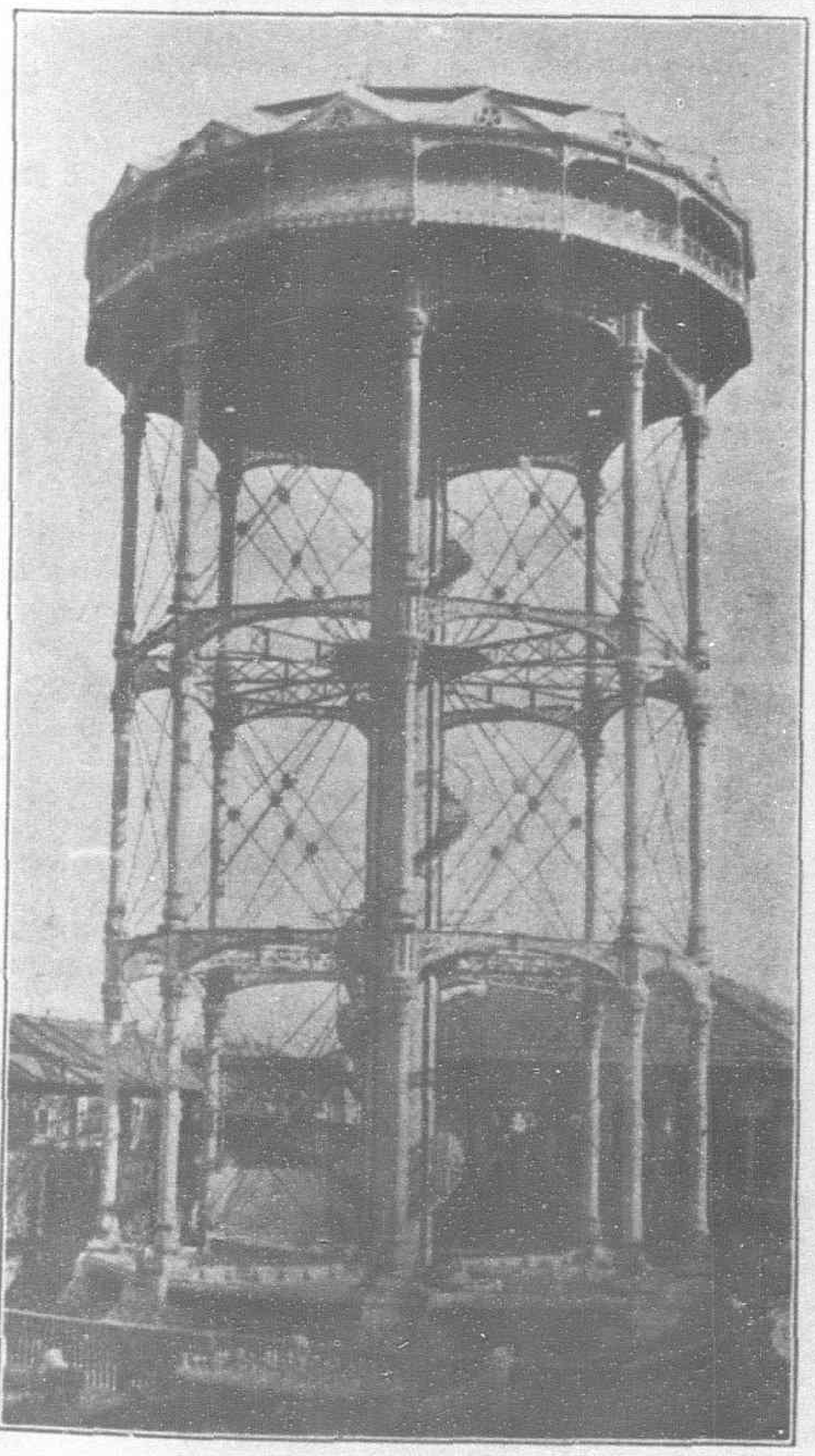
SHANGHAI MUNICIPAL JAIL.



CHINESE PUBLIC SCHOOL BAND.

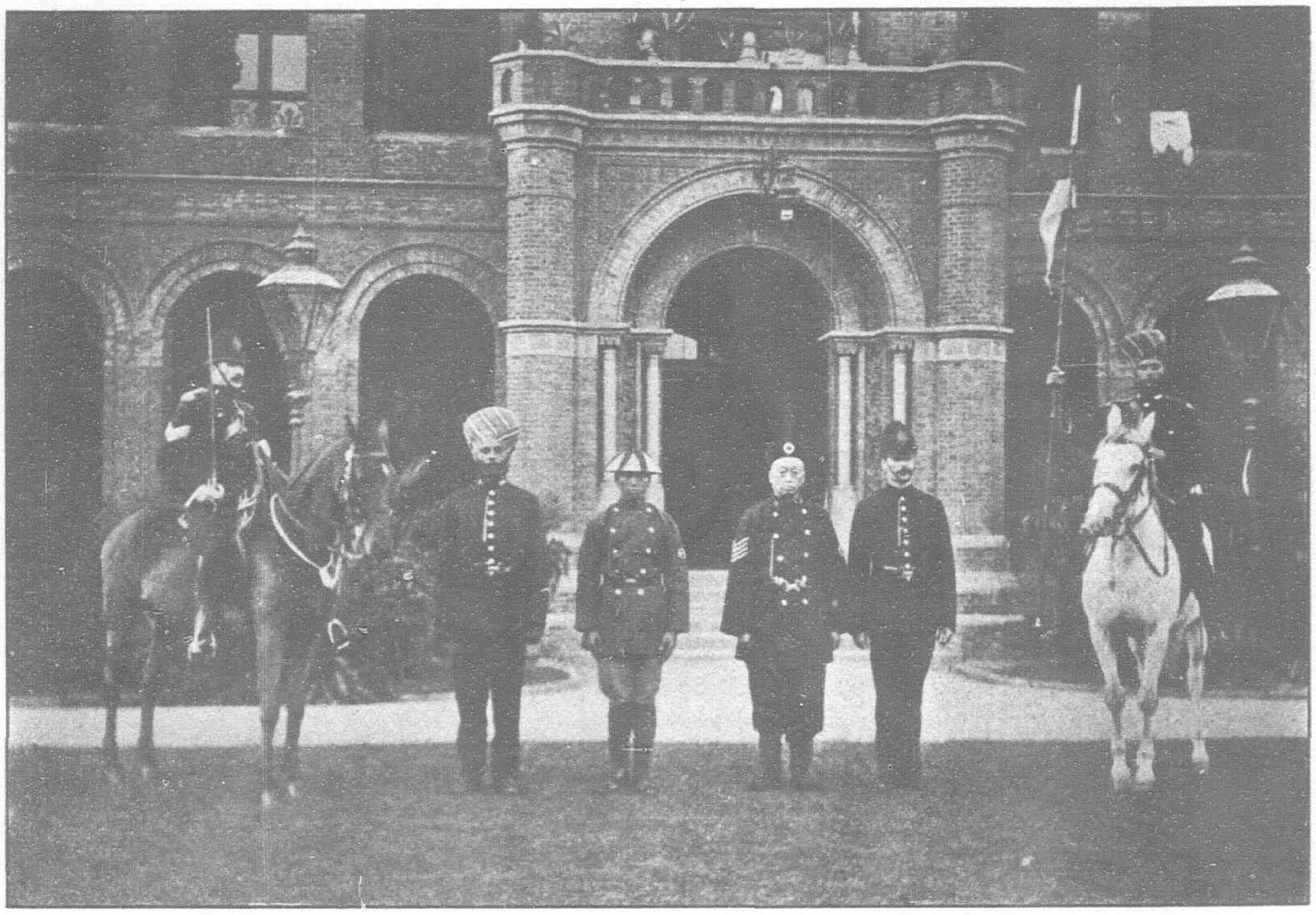


SHANGHAI GAOL.—FLATS AND GODOWNS

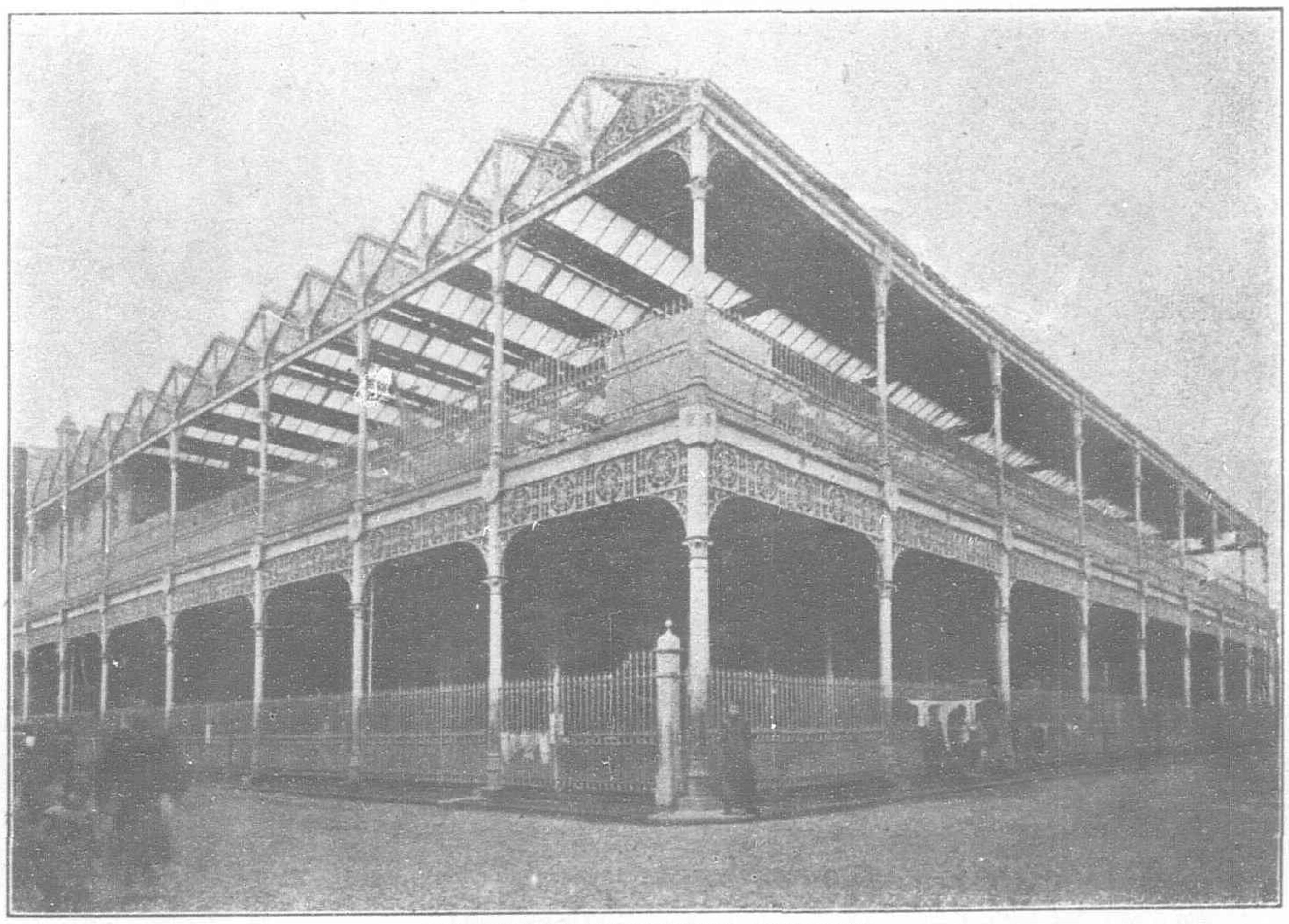


WATER TOWER, SHANGHAI WATERWORKS,
ON KIANGSE RD.

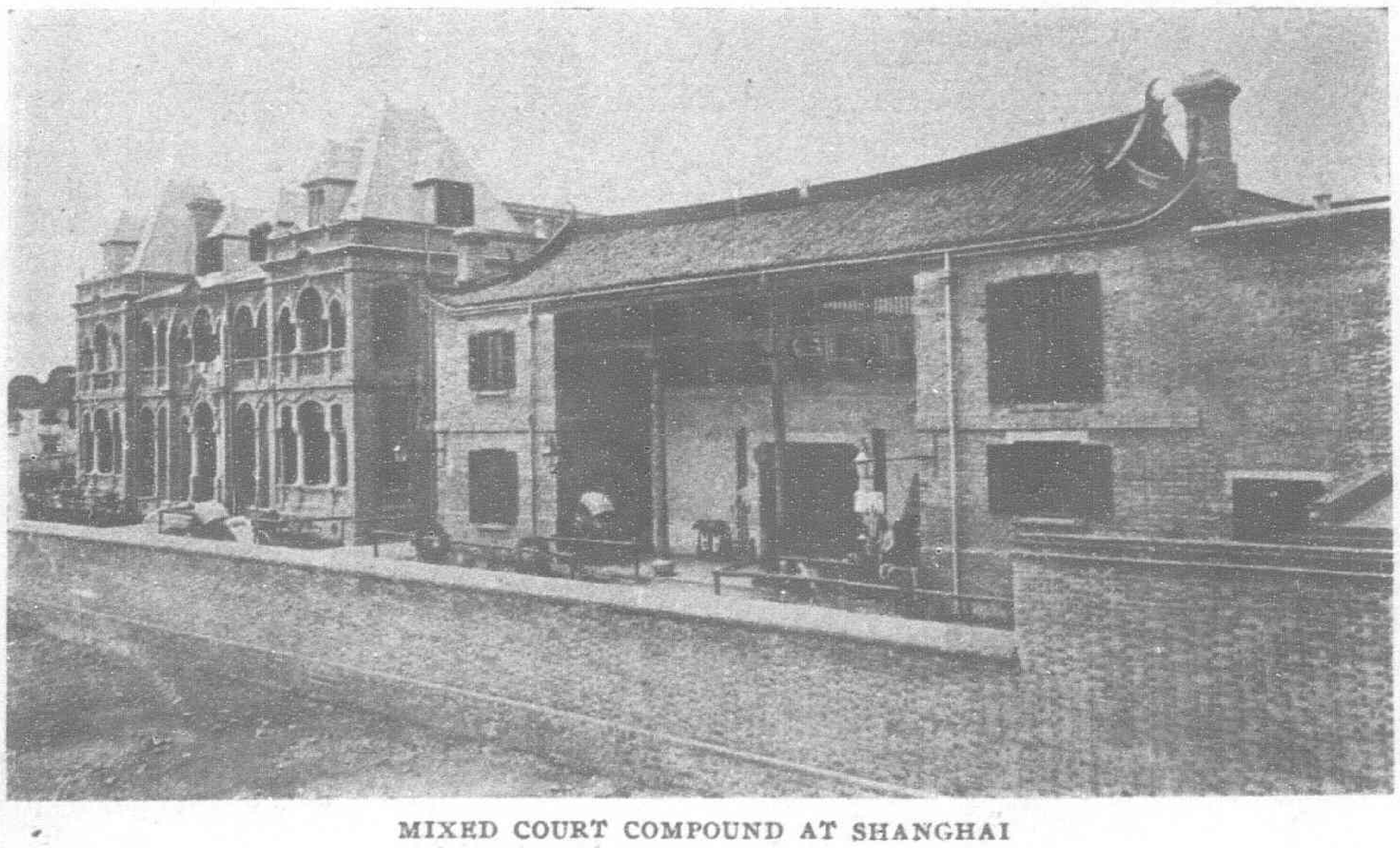
SHANGHAI MUNICIPAL LABORATORY



TYPES OF SHANGHAI MUNICIPAL POLICE



SHANGHAI MUNICIPAL MARKET



MIXED COURT COMPOUND AT SHANGHAI

SHANGHAI MUNICIPAL ELECTRICITY WORKS

The following notes on the equipment and operation of the plant were furnished through the courtesy of Mr. T. H. U. Aldridge, M. I. E. E., the Municipal Electrical Engineer.

The undertaking was originally started in 1882 by a company. In 1893 the Council took over the undertaking when the rated capacity of the Electricity Works was 174 kilowatts. A new generating station was opened in 1896 at the corner of Yuhang and Fearon Roads on the Hongkew Creek. Some of the old machinery from the original station was transferred and other new plant installed. For years, however, the undertaking was a success neither financially nor technically. In 1901 the present Municipal Electrical Engineer, Mr. T. H. U. Aldridge, M. I. E. E., was appointed to take charge of the department. Since that date the generating station, completed in 1896, has been—with the exception of two main walls—entirely demolished, re-built and re-modelled upon modern lines. The station in 1901 contained just over 500 kilowatts of plant capacity. At the end of 1908 the plant capacity was 4,400 kilowatts which will probably be increased during the next twelve months to 5,700 kilowatts by certain modification to two of the existing turbo-alternators and by the installation of two 500 kilowatt exhaust turbines.

Mechanical coal handling is the practice in the Station. The coal is elevated into large overhead storage bunkers by a bucket conveyor; the boiler coal hoppers are fed by gravity through coal chutes from the overhead bunkers; and mechanical chain grate stokers are fitted to each boiler. The ashes are raked from under the fire grates by manual labor and fed into the same bucket conveyor which transports the ashes into a special ash bunker conveniently situated at the end of boiler house nearest the road from whence the ashes are fed through a gravity chute into carts for removal. It has been found in practice that the introduction of mechanical coal and ash handling appliances and mechanical stokers has worked out cheaper than the large quantity of native labor formerly employed for the same purposes. Furthermore very great fuel economies have resulted from mechanical stoking. Feed water is heated up by means of an exhaust steam feed heater and separate economisers fitted to the main flue of each individual boiler.

Superheating the steam to 100° Fah. is the rule. Systematic records, by means of recorders, are kept of the temperature of feed water, steam pressure, and percentage of CO_2 in the flue gases. Both the coal handling plant and the stoker driving mechanism are operated by single phase induction motors.

In the engine room all the high tension switchgear is housed in an annex. The switchgear for each generator and for each high tension outgoing feeder is contained in a separate concrete cubicle. It is of the remote control electrically operated oil break type. On the feeders both horn type and multigap lightning arrestors are connected with the usual isolating links for cutting them out for examination and cleaning. The switchgear low tension operating panels are supported on a concrete and steel platform at one end of and overlooking the entire engine room. It will be seen from the list of plant below that there are several types of plant installed. It may be interesting to note that parallel running of the one crank, two crank and turbine engines, is performed without trouble and this in spite of the fact that no less than four different types of engines and alternators are installed. Each large engine and turbine is provided with its own separate steam driven condensing plant. The condensers for the direct current traction plant are electrically driven by D C 500 volt motors.

Transmission and distribution is on the overhead system. The high tension feeder cables are vulcanized rubber insulated cable, the low tension feeders and distributors bare cable. The high tension feeders supply into some thirty sub-stations, all above ground. Very few pole transformers are in use; they are employed only in outlying country districts where the demand for lighting or power

CLUB CONCORDIA, ON THE BUND, SHANGHAI.—ARCHITECTS: BECKER & BAEDEKER

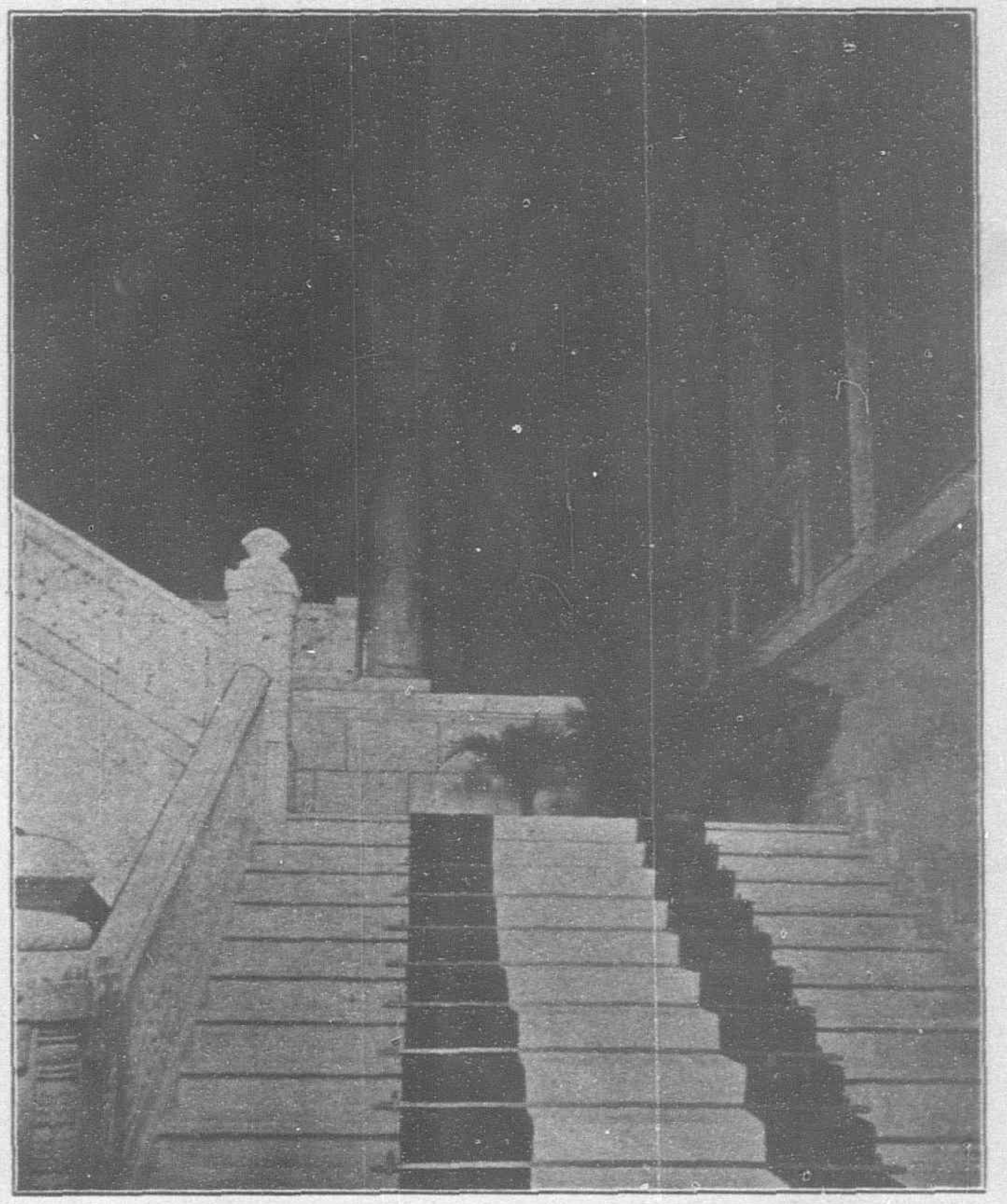
is not sufficient to justify the building of a brick sub-station. Each feeder is arranged on a ring system and looped into various sub-stations so that repair or other work on the high tension lines may be carried out, without interruption of supply to consumers, by feeding round the other half of the ring whilst the section under repair is dead.

The consumption of all consumers is metered and the charge based according to the consumption registered.

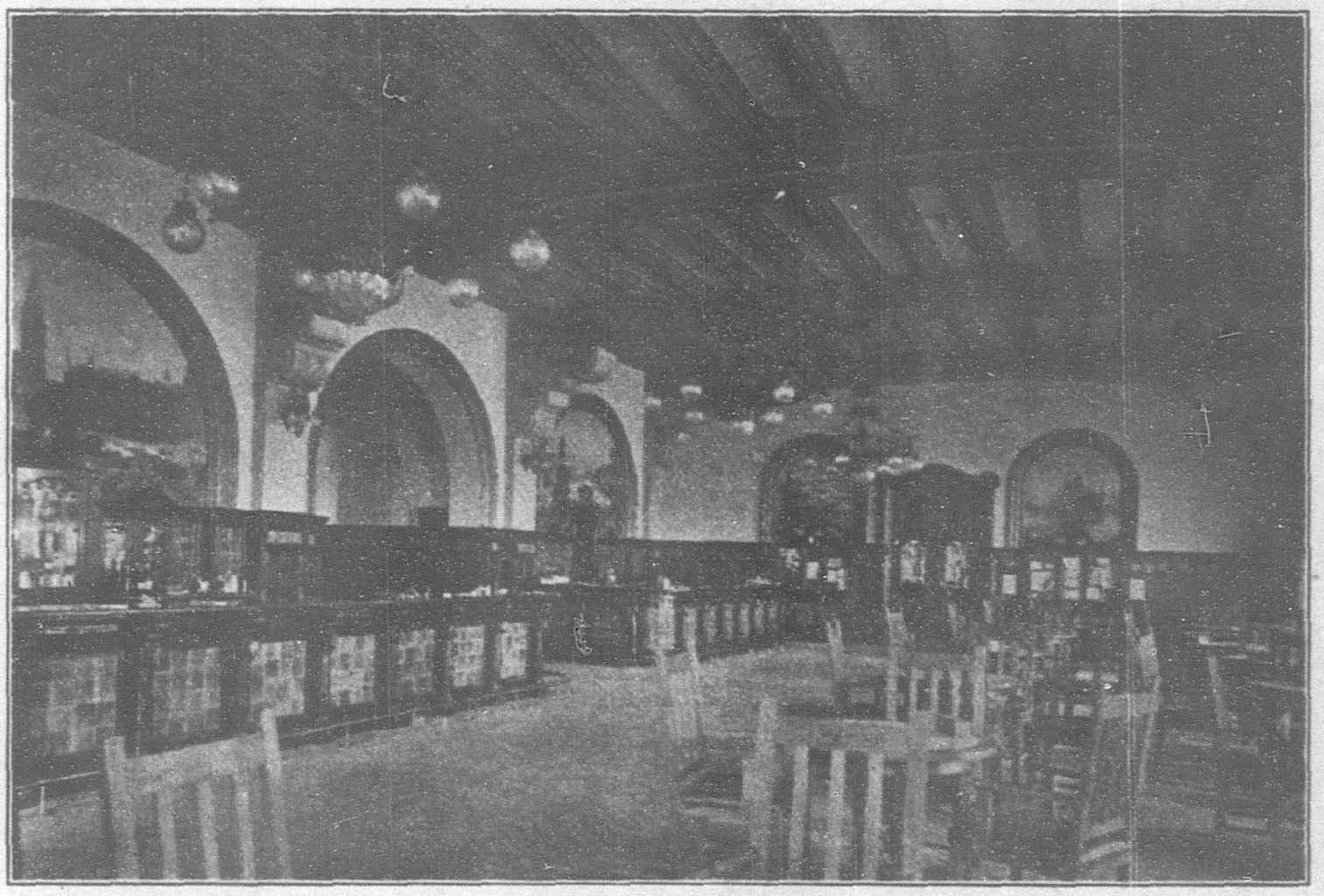
There are now over 300 public street arc lamps in use mostly of the constant current series enclosed type. Flame arcs are also used in some of the more important thoroughfares. 60 candle power metallic filament lamps were recently introduced for side street and country road lighting. There are at the present time connected and being connected over 300 of these lamps for street lighting. They are rapidly replacing incandescent gas lamps on account of their superior illuminating properties and the retention of their initial candle power over long periods.

The electric motor is coming well to the front in Shanghai. In April this year there was an aggregate of 552 horse power connected to the municipal mains. It is expected that the figure will be increased to at least 850 H. P. by the end of the year.

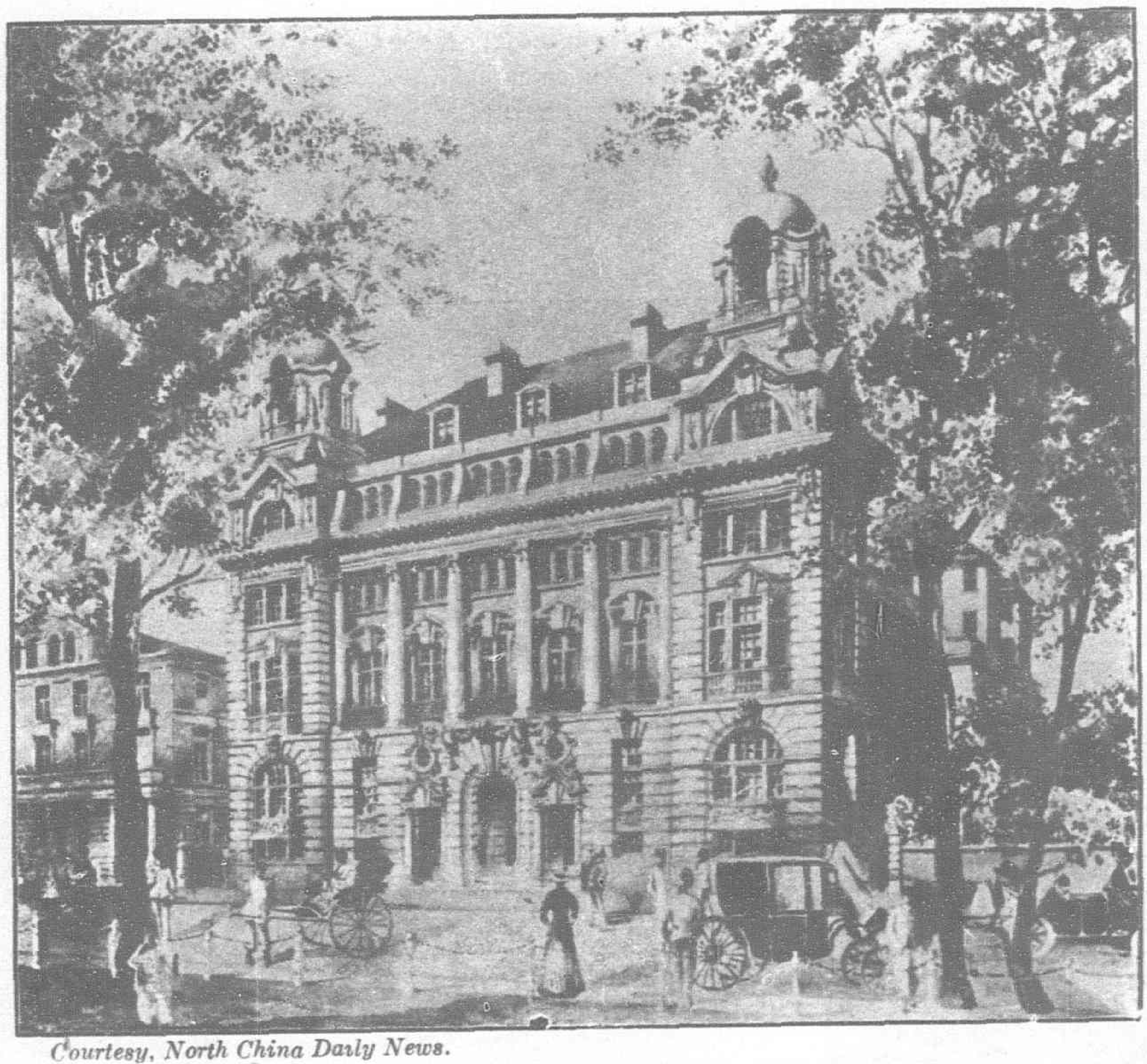
Electricity for lighting, heating, power and traction is sold cheaper in Shanghai than in any other city in the East. It is the policy of the department to supply electricity for all or any purposes at as cheap a rate as possible. In 1901 the price per unit (kilowatt hour) for private lighting was 20 candareens. The present price is from 13 down to 9 candareens. Public Lighting was then charged at Tls. 250 per arc lamp per annum and is now Tls. 130. Electricity for heating and power purposes is



MARBLE STAIRCASE, CLUB CONCORDIA, SHANGHAI

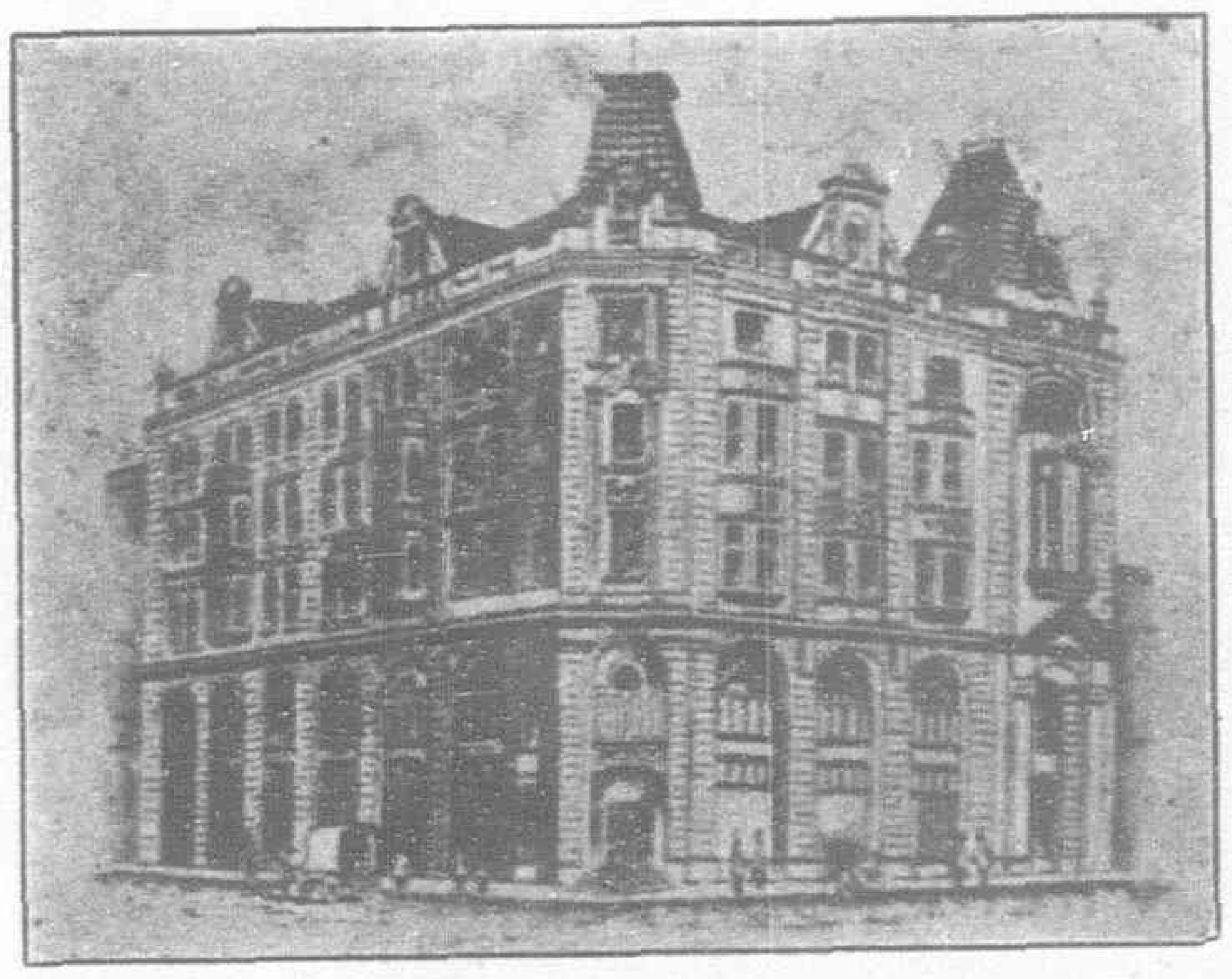


CLUB CONCORDIA, BAR



Courtesy, North China Daily News.

THE NEW HOME OF THE SHANGHAI CLUB

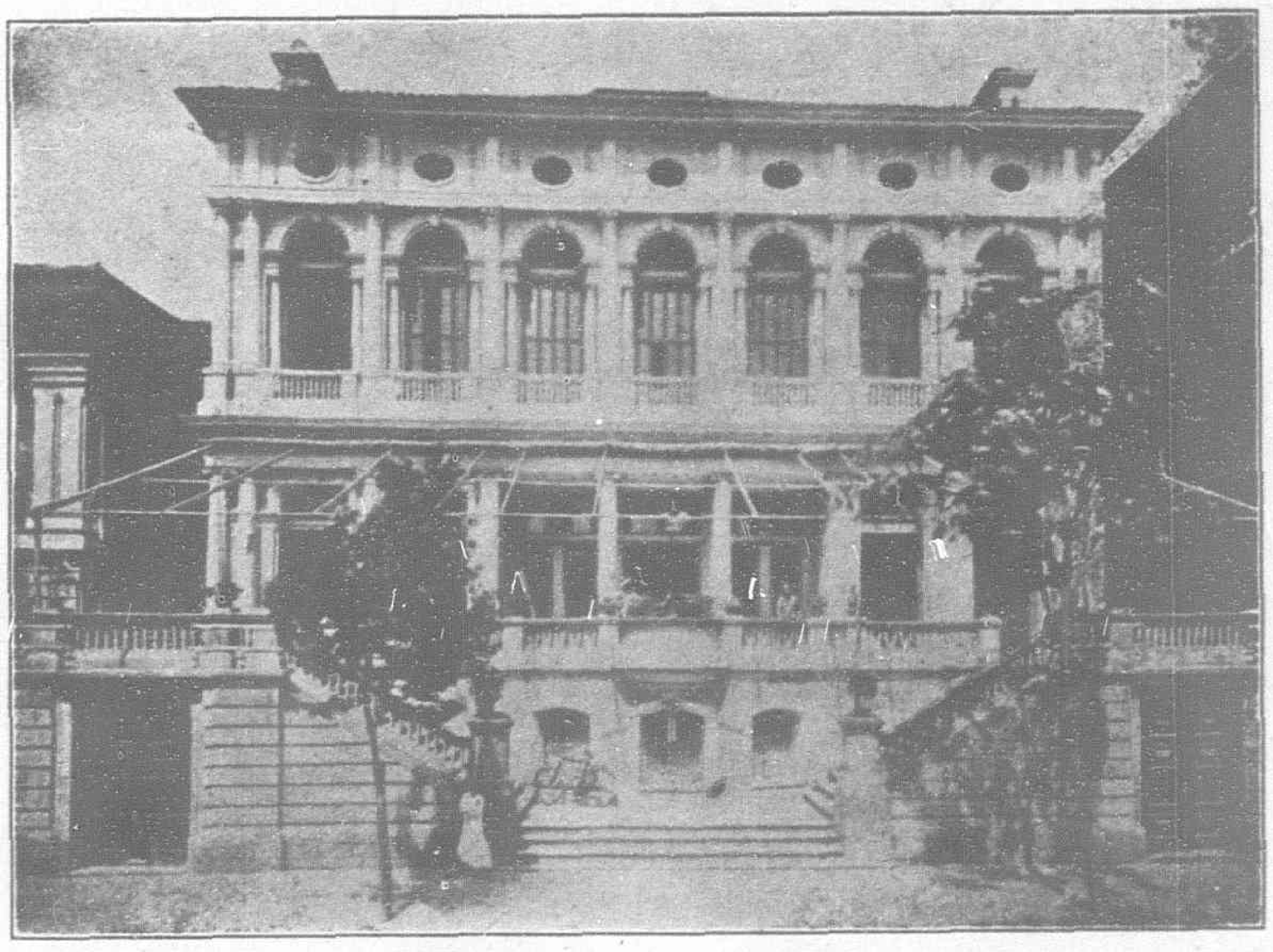


WHITEWAY LAIDLAW BUILDING, NANKING AND SZECHUEN ROADS, SHANGHAI.—OFFICES OF THE FAR EASTERN REVIEW

sold at 6 candareens with a sliding scale down to 4.75 candareens. For traction 4.8 to 4.4 candareens per unit.

The following are details of the system and plant:—

Single-phase, alternating (50 per sec.), 2,000 volts, transformed at sub-stations to two and three wire distributing network; 100, 200, 400 volts for supply. Mains, overhead. Boilers—Two Aultman & Taylor, six Babcock & Wilcox marine type, with self-contained feed-water heaters; chain-grate stokers; induced draught; self-contained and separately fired superheaters. Babcock & Wilcox mechanical coal and ash handling plant. Engines—One 150 K. W. Belliss-Mather & Platt; two 150 K. W. Brush; two 600 K. W. Ferranti steam alternators; one 800 K. W. Parsons-Peebles and one 800 Willans Peebles turbo-alternators. Two 600 K. W. Belliss-Peebles 500 to 550 volt D. C. traction generators, one 300 K. W. single phase motor generator, 2,000 volts A. C. to 500 D. C. for traction, and one 50 K. W. motor generator, 2,000 volts A. C. to 500 D. C. Brown-Boveri H. T. remote control switchgear; British Westinghouse electrically tripped feeder board; Ferranti traction switchboard. Supply commenced, 1882.



MASONIC CLUB, SHANGHAI

DINING ROOM—CLUB CONCORDIA

The estimated profit for the year 1908 was Tls. 66,475. The actual profit made was Tls. 91,375 or 37% more than estimated. This represents a profit after paying interest equal to 6½% on the capital invested in the undertaking, or including interest a profit of 12½% on the year's working. Out of this profit certain expenses have been met, the principal one being the sum of Tls. 23,236 written off the value of part of the old buildings, which were demolished to make room for more commodious and useful ones. The cost of changing over numerous consumers, installations to make them suitable for 200 volt supply was responsible for Tls. 4,975. In all, extraordinary expenses total Tls. 32.878. After meeting these there is a net profit of Tls. 58,497 equal to 4¼% which with 6% interest amounts to 10¼% on the capital.

The sale of electricity for 1909 is estimated to yield a net profit of 93,000 Tls. This result is expected although the prices for electricity for private and public lighting, for power and heating were substantially reduced as from the 1st January this year.

Capital at end of 1908 Tls. 1,369,000.

COMPARATIVE TABLE

	Equivalent No. of 8 c. p. lamps connected.	% Increase.	No. of House Service connections added during the Year.	Units Sold. Private Lighting.	Units Sold. Public Lighting.	Units Sold. Power and Heating.	Units Sold. Traction.	Units Sold. Accounted for and used at Work.	Total Units Sold and Accounted for.	% Increase.	Coal. Tons.	Lbs. Coal per Unit Sold.	Max. Load K. W.	% Increase.	% Load Factor.
1900	17,148	23%	54	....	......	......	....	......	523,922	11%	4,800	20.52	292	....	....
1901	21,812	27%	53	....	......	......	....	......	568,669	8%	4,850	19.10	320	9%	....
1902	31,841	46%	139	....	......	......	....	......	754,342	32%	4,570	13.57	444	38%	....
1903	42,500	34%	270	....	......	......	....	......	996,021	32%	6,072	13.65	580	26%	....
1904	66,840	57%	402	853,147	319,499	16,834	....	25,082	1,214,562	22%	8,679	16.00	858	48%	16.2
1905	88,201	31%	249	1,277.140	410 241	34,350	....	54,592	1,776,323	45%	10,629	13.40	1,090	27%	18.6
1906	108,525	23%	414	1,704,563	451,950†	65,932	....	85,230	2,307,675	30%	12,681	12.30	1,411	29%	18.6
1907	140,846	30%	529	2.065,499	457,207†	141,146	....	79,536	2,743.388	19%	13,489	11.01	1,630	15%	19.2
1908	171,918	22	622	2 391,586	445,143	158,455	1,430,889	206,702	4,632,775	68%	14,099	6.82	2,500	53%	21.1

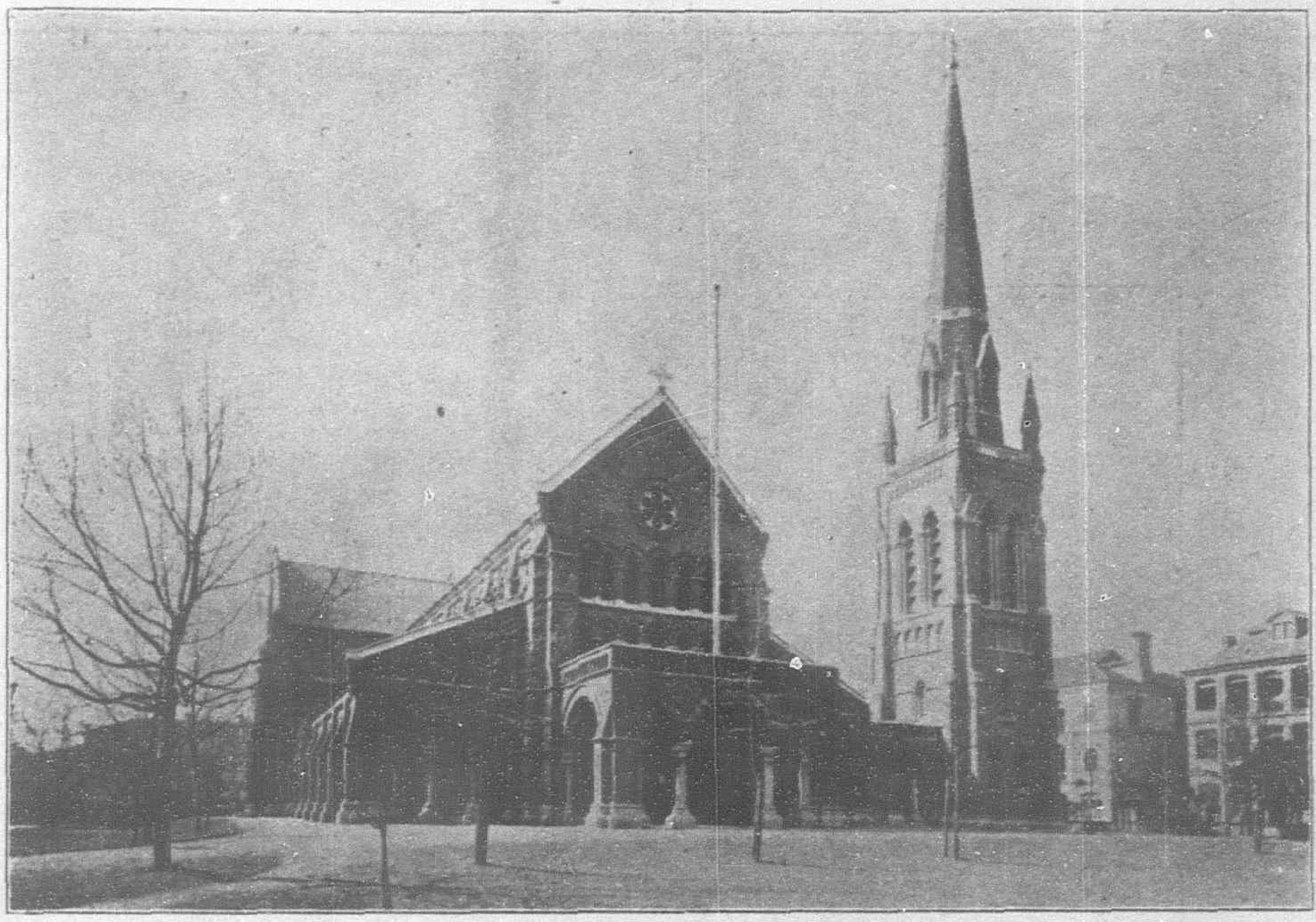
† The explanation of these greater number of units is that they are calculated whereas in 1908 they were actually metered.

IRRIGATION IN VICTORIA

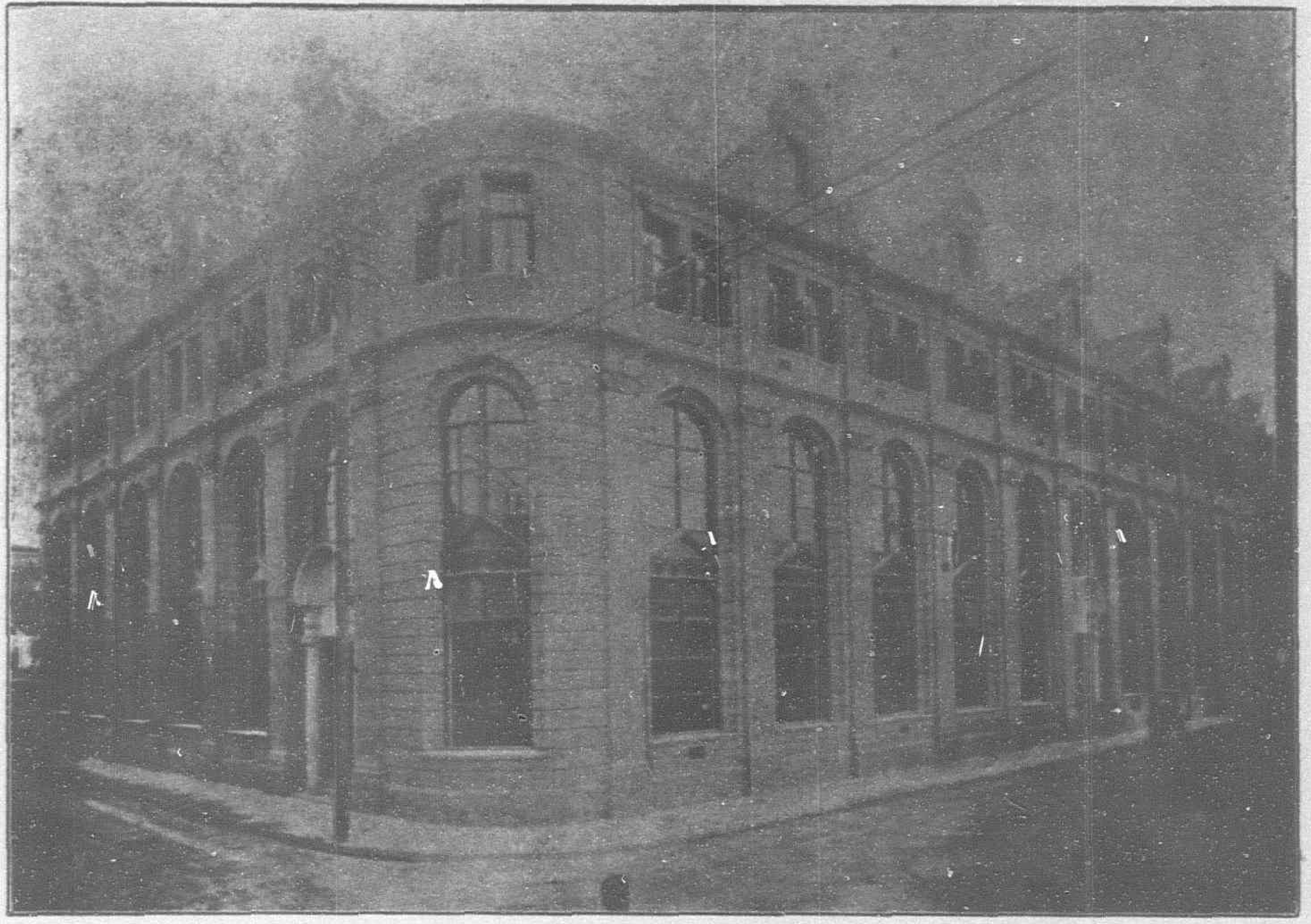
By H. G. M'Kinney, M. Inst. C. E.*

The subject of irrigation in New South Wales and the manifold benefits arising from irrigation have been dealt with in innumerable speeches, reports and newspaper articles during the past 25 years. At every general election, and during every drought, many torrents of eloquence on this subject have been poured out over the heads of the electors. It would almost appear that the possibility of being deprived of such an excellent stock subject as the necessity for irrigation might to some extent account for the fact that many of the politicians who made long speeches regarding it were lukewarm, if not hostile, when any practical steps were proposed. As regards the general fate of reports dealing with it, the words of Dickens in his immortal chapter on "The Whole Science of Government," are fairly applicable. In describing what happened to complaints, applications and other matters which reached the Circumlocution Office, Dickens said: "Boards sat upon them, secretaries minuted upon them, commissioners gabbled about them, clerks registered, entered, checked and ticked them off, and they melted away." However, New South Wales is at last embarked on an active policy of construction of large irrigation works, and it is, therefore, a matter of present interest to consider the financial aspect of the question.

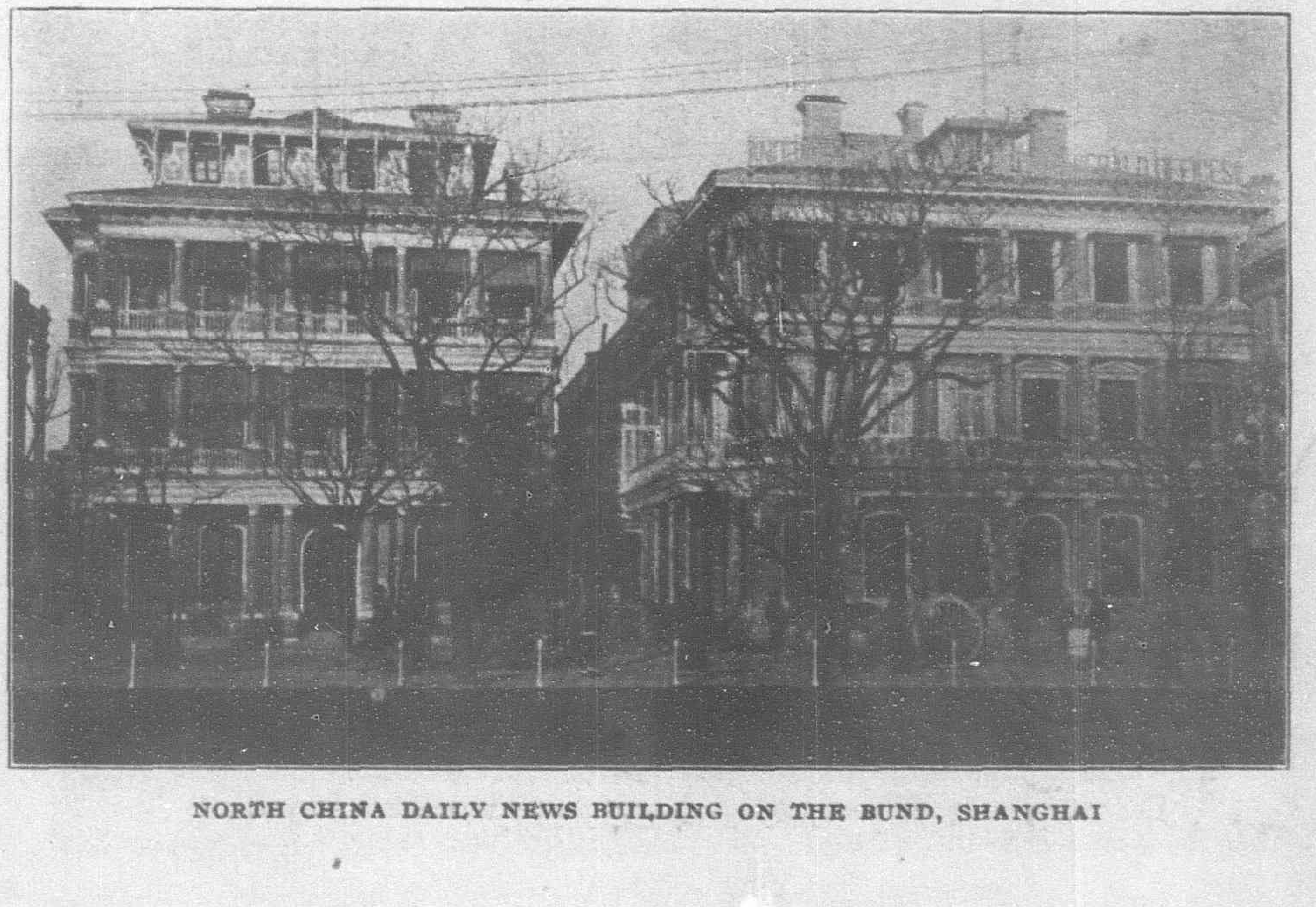
As Victoria is fully a quarter of a century ahead of New South Wales in regard to the construction of irrigation works, and as the vigorous irrigation policy of that State is often held up as an example to New South Wales, it is instructive to compare the conditions in the two States, to consider what has been done in Victoria, and to examine the results accomplished and the cost at which these results have been attained. On examining the map of Victoria we find that of the total area, amounting to about 87,000



TRINITY CATHEDRAL, SHANGHAI



IMPERIAL CHINESE POST OFFICE, SHANGHAI



NORTH CHINA DAILY NEWS BUILDING ON THE BUND, SHANGHAI

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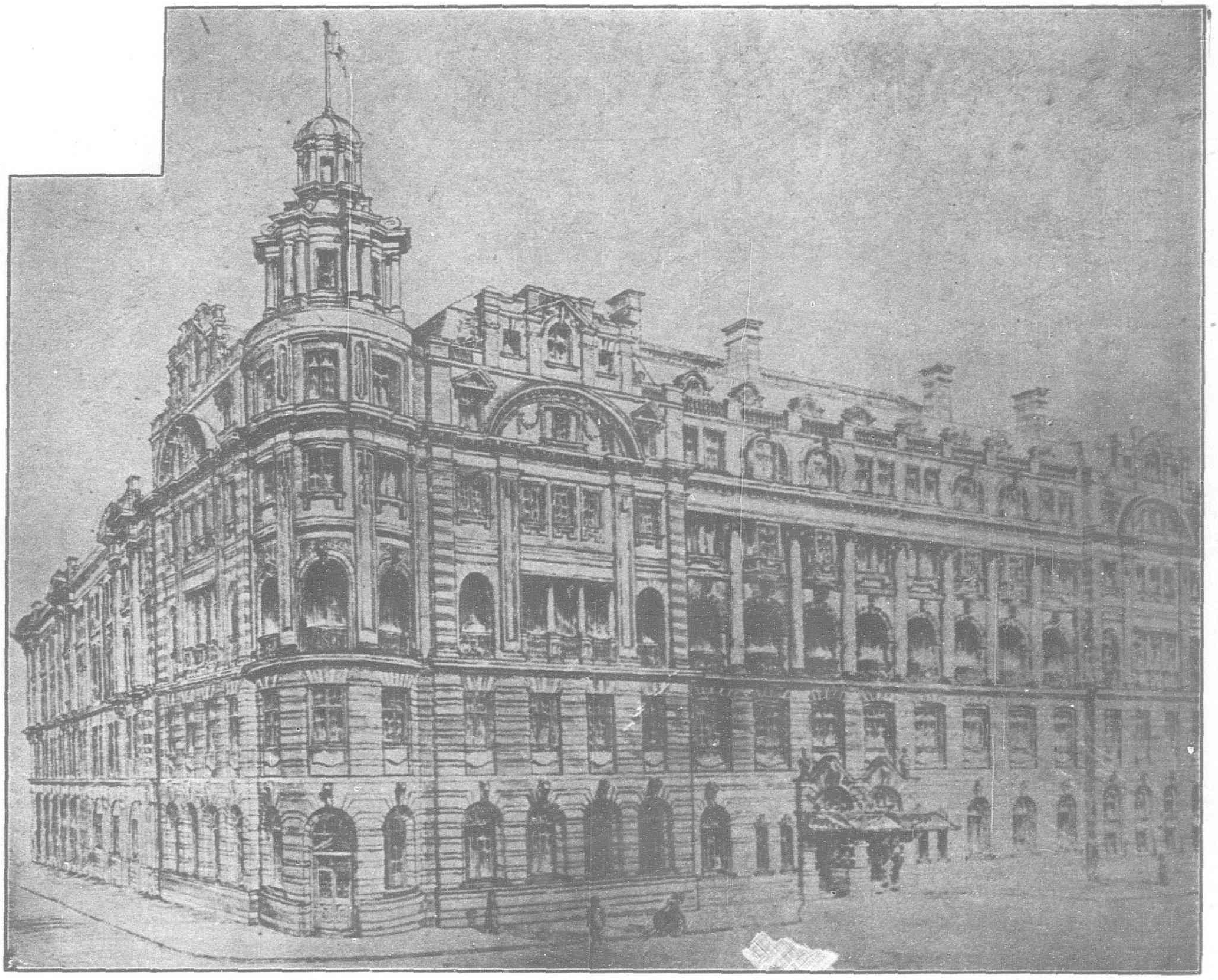
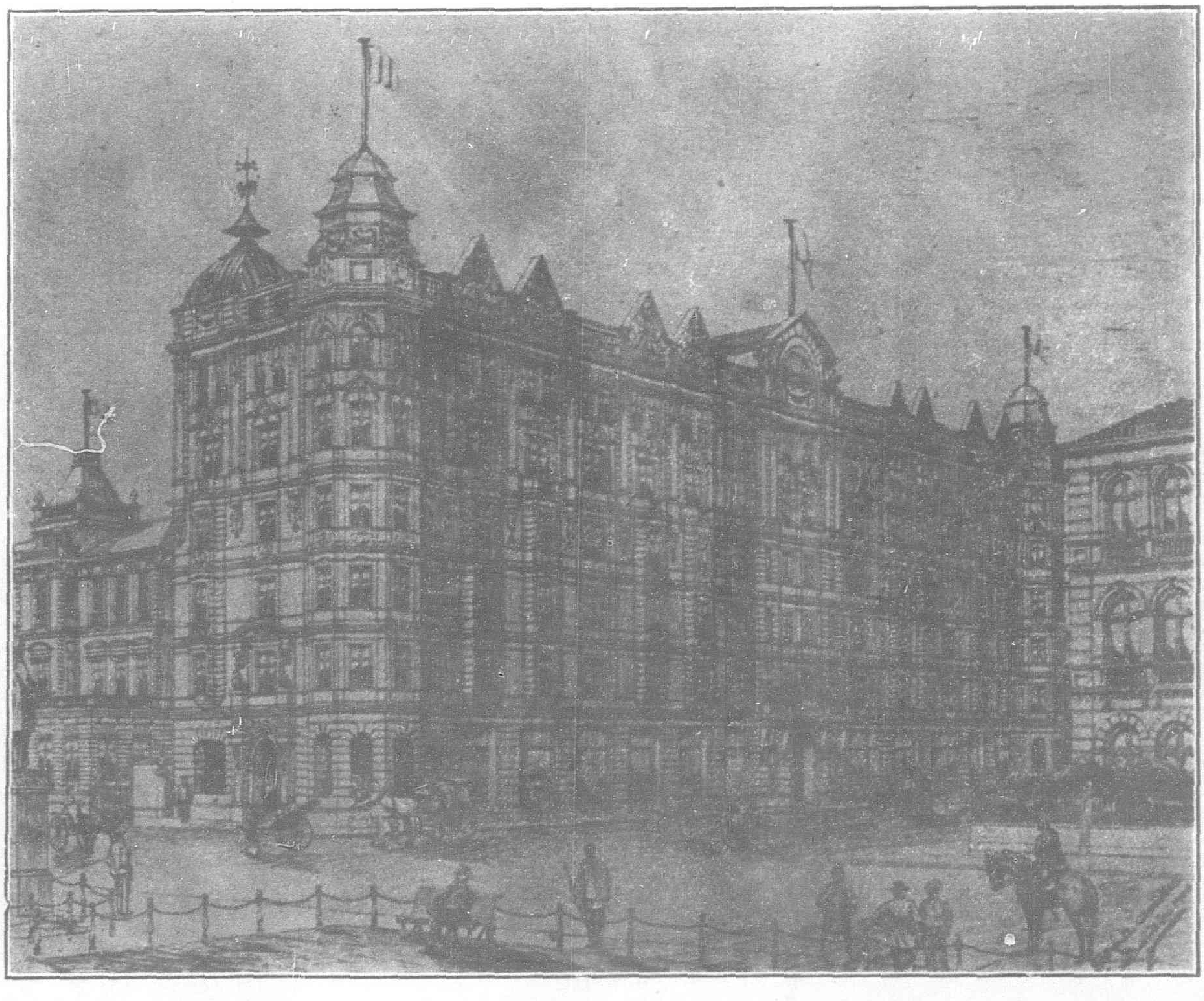
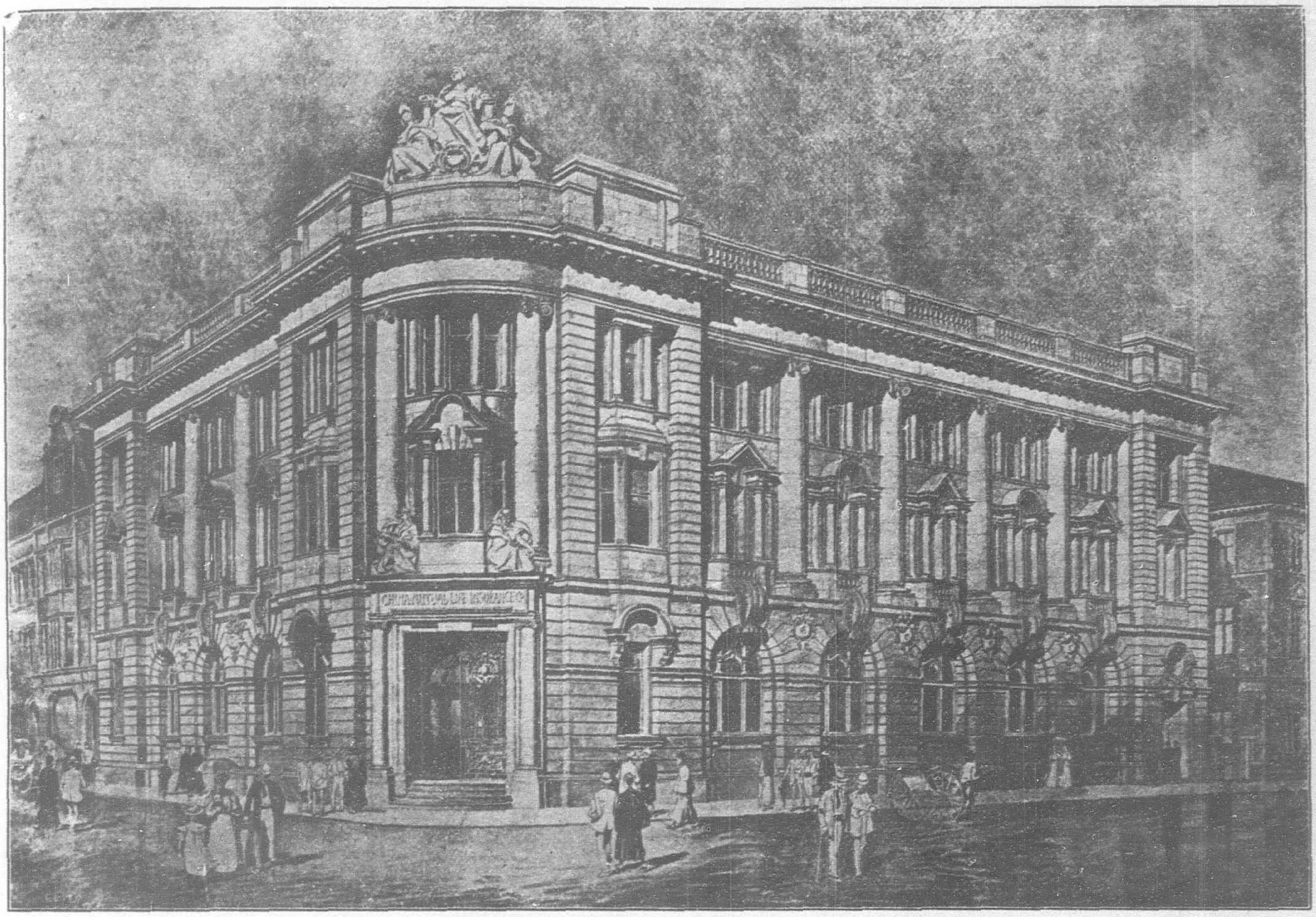
*The Engineering Record.



NEW ASTOR HOUSE HOTEL, UNDER ERECTION.—*(Davies & Thomas, Architects.)*

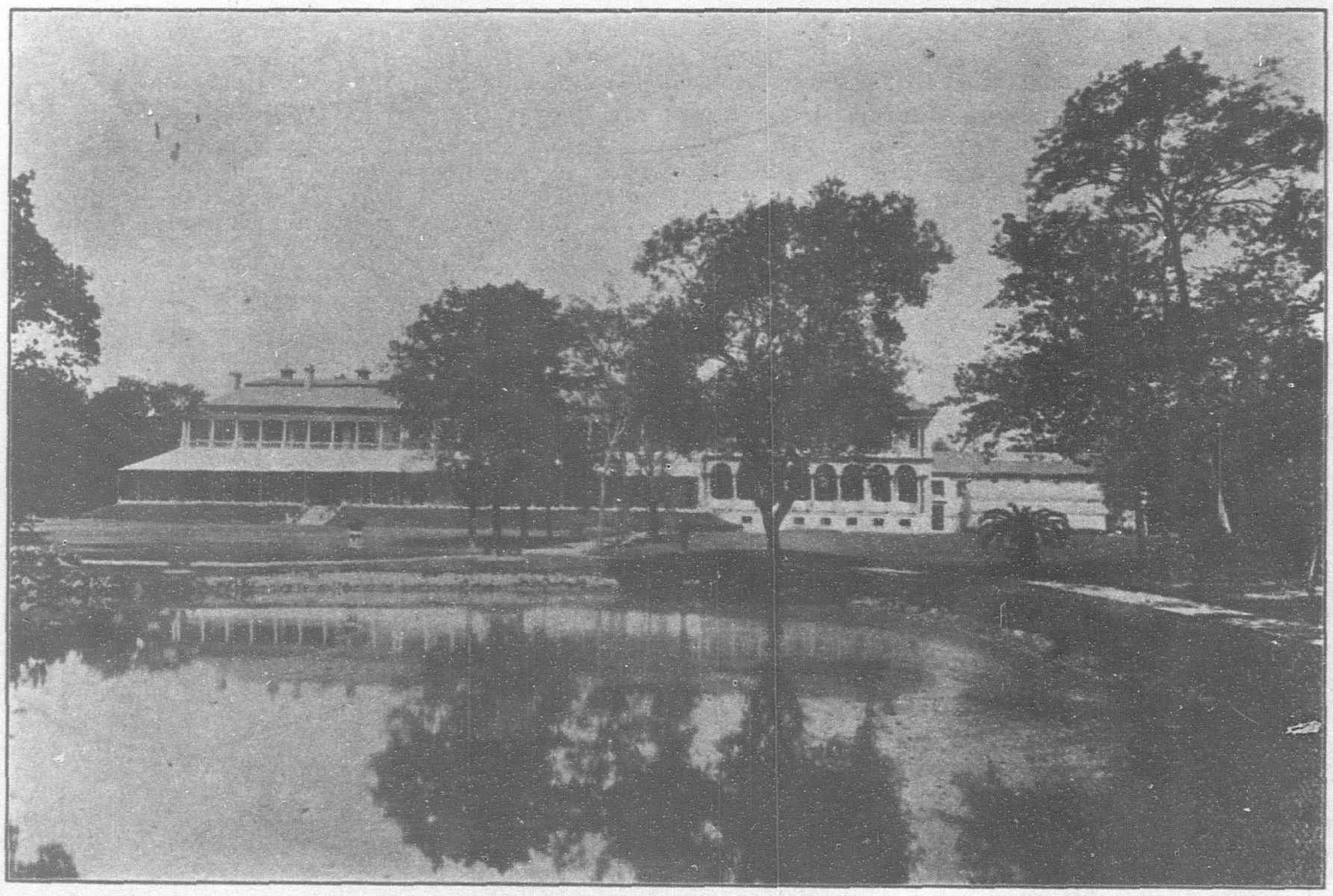


NEW PALACE HOTEL.—*(Scott, Christie & Johnson, Architects.)*

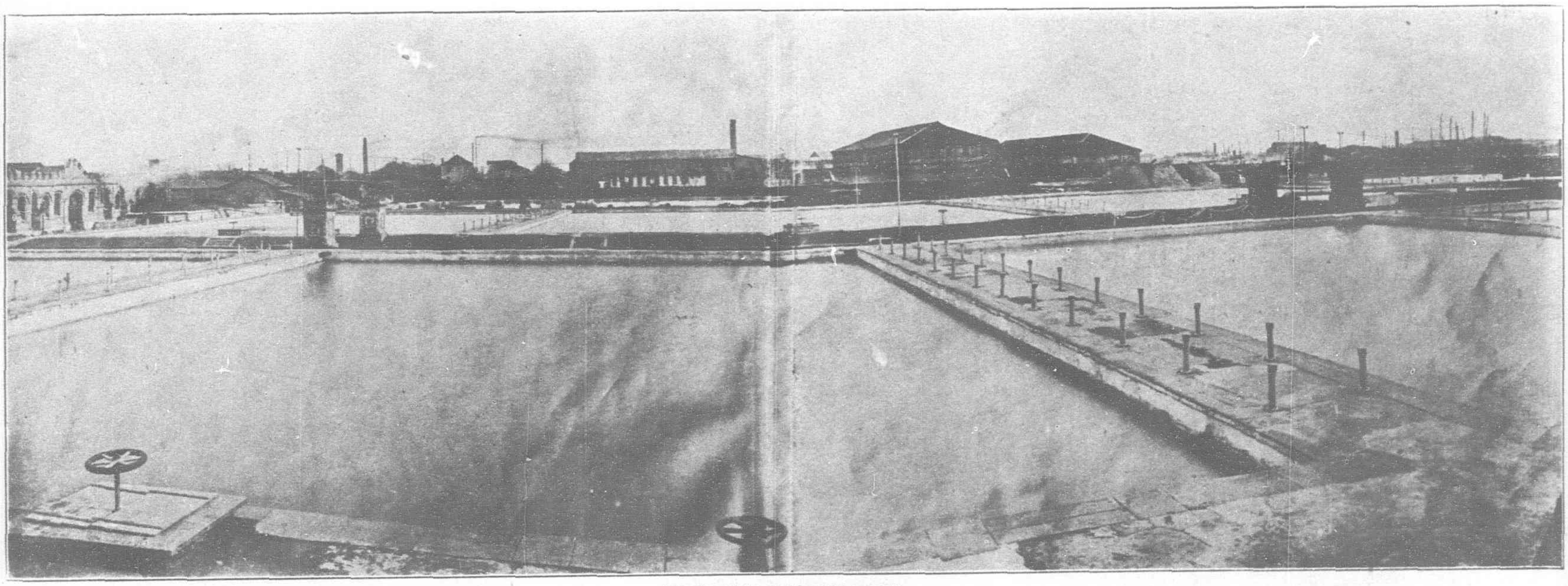


NEW OFFICES OF THE CHINA MUTUAL LIFE INSURANCE CO., LTD., SHANGHAI

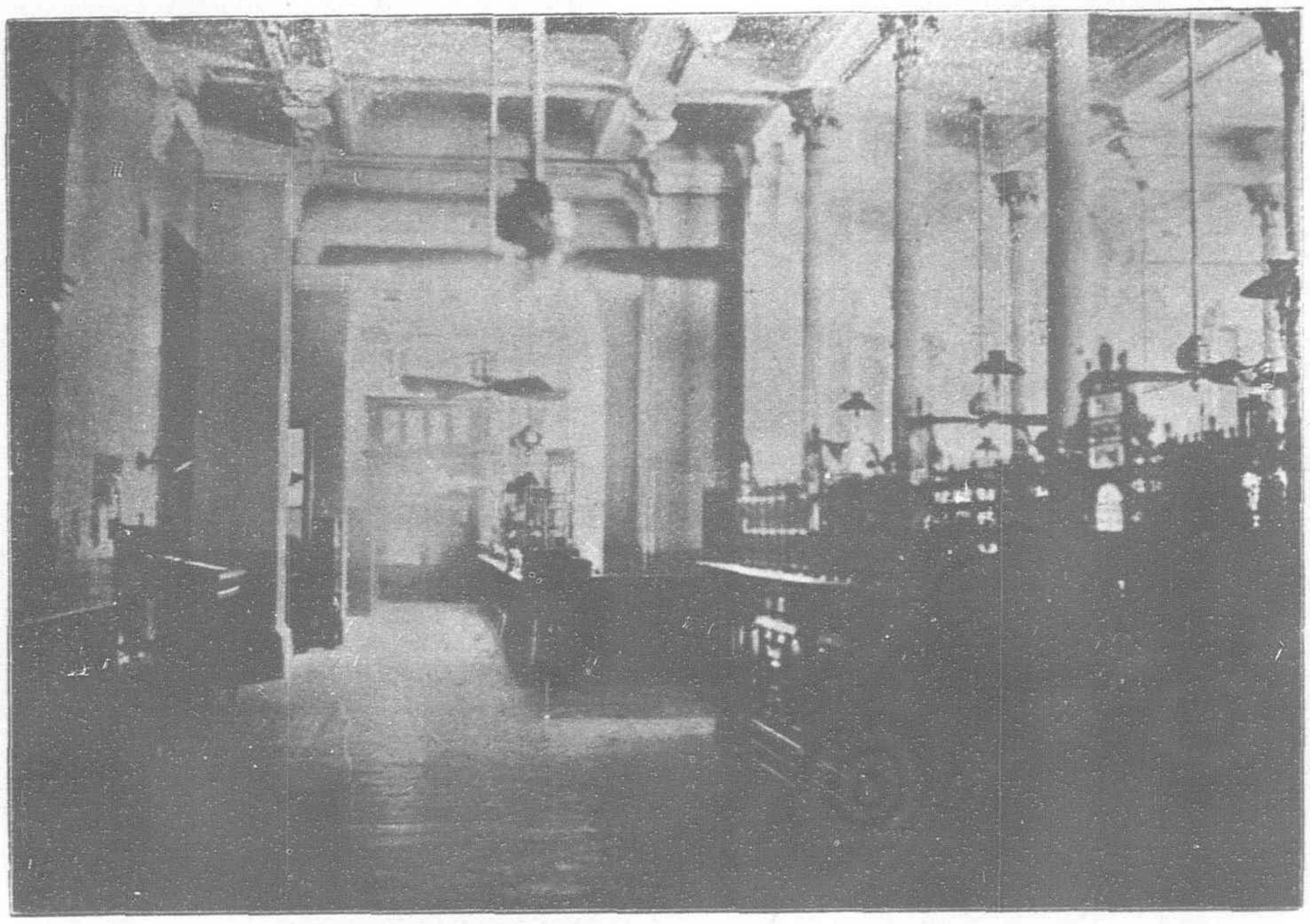
sq. miles, about 51,000 sq. miles belong to the basin of the River Murray. Of this area of 51,000 sq. miles, the northern plains and the mallee country represent 34,000 sq. miles. The northern plains are the great field for irrigation in Victoria, their contiguity to the River Murray, and the fact of their being intersected by a series of tributaries of that river, affording excellent facilities for irrigation on a large scale. The relatively great area of these plains, the fertility of their soils and their comparatively moderate distance from Melbourne combine to render them of vital importance to Victoria. On the other hand, the great field for irrigation in New South Wales—that is, the district



THE COUNTRY CLUB, SHANGHAI



SHANGHAI WATERWORKS

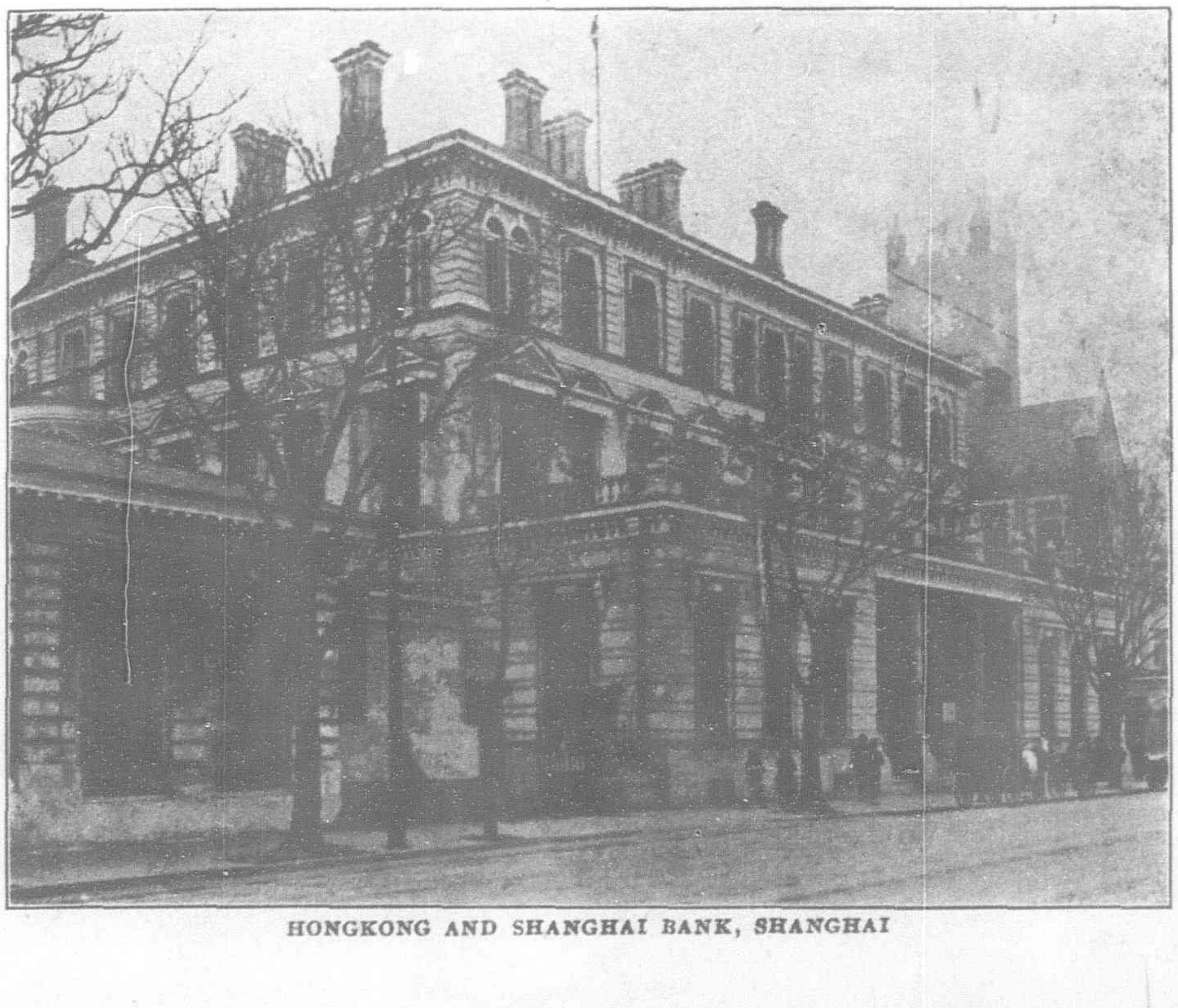


INTERIOR OF HONGKONG AND SHANGHAI BANK, SHANGHAI

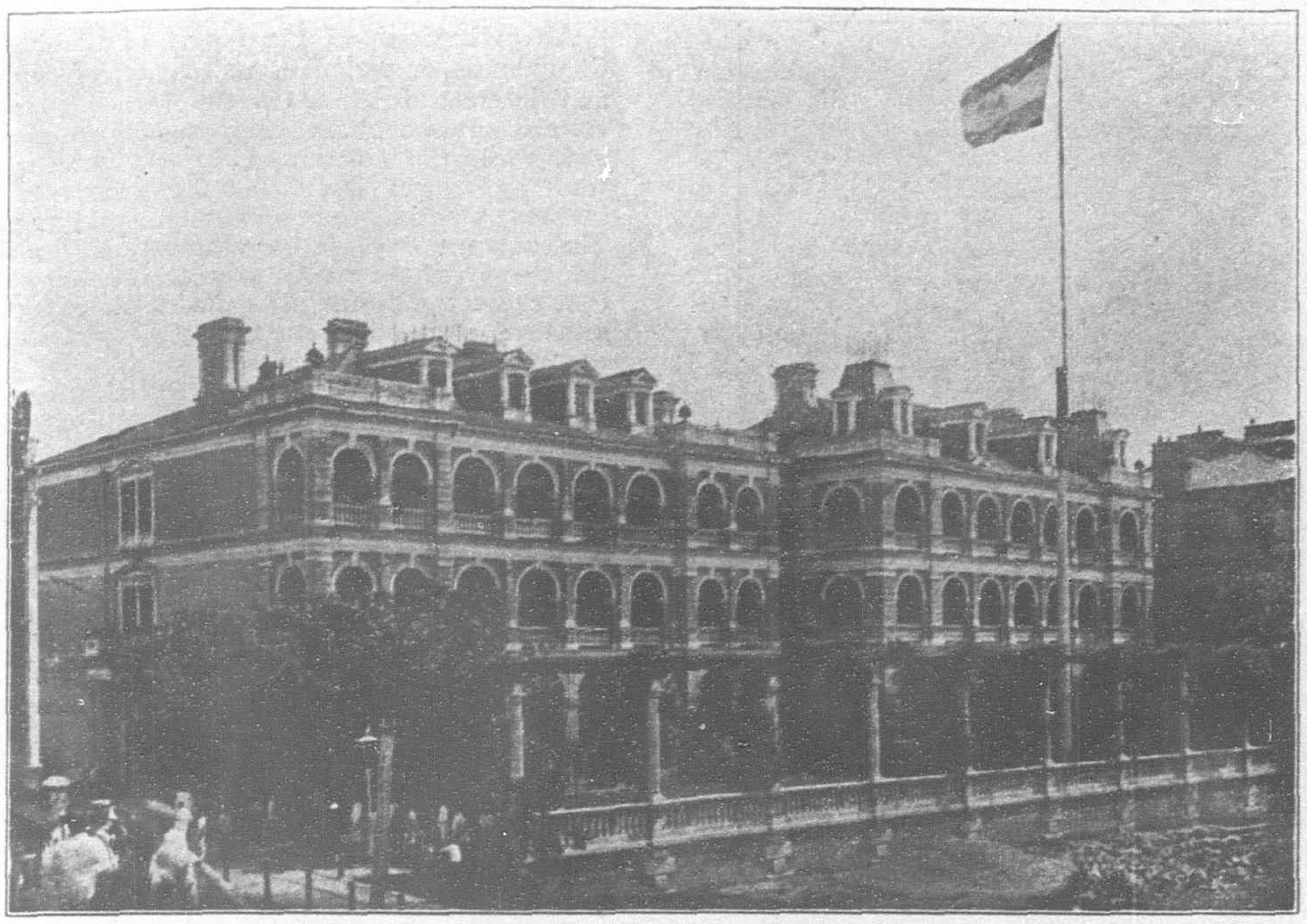
between the Murray and the Murrumbidgee and the plains on the north side of the latter river—though fertile and valuable in a high degree, occupies no such relative position in New South Wales as is occupied by the northern plains of Victoria in that State. It is necessary to bear this difference in mind when considering the manner in which the financial aspect of irrigation has been treated in Victoria and the manner in which it is likely to be treated in New South Wales.

In the early eighties the question of irrigation in Victoria was brought prominently to the front, largely through the eloquence and enthusiasm of Mr. Deakin, who was then premier and minister for water supply. A series of valuable reports were jointly prepared on the subject of water conservation and irrigation by Mr. George Gordon, M. Inst. C. E., chief engineer for water supply, and Mr. Alexander Black, surveyor-general. The former had a wide experience of irrigation in India, while the latter had a comprehensive knowledge of the natural conditions and of the conditions of land occupation in Victoria. Unfortunately, at the outset the business aspect of the irrigation question was lost sight of, and, judging from the subsequent report of a Royal Commission, it would appear that the main object in view was to create what Americans would describe as a great irrigation boom. The first important step was to discard the advice and dispense with the services of the only experienced irrigation engineer in that State—Mr. George Gordon. Then followed a period of mismanagement and extravagance which did much to discredit the cause of irrigation in Australia. Although Mr. Deakin visited America in the early part of that period, and published a most instructive and valuable report on irrigation in the Western States, showing how splendid progress was being made without the expenditure of a single dollar of public money, the lessons to be derived from this report were entirely disregarded in Victoria. Under the authority of a special Act of Parliament, irrigation trusts were authorized to borrow money from the government of that State for the construction of irrigation works and such trusts were rapidly constituted in all directions. Applications for loans quickly poured in, and were met with a lavish hand. No time was lost in spending the money thus advanced, while, at the same time, the government energetically entered on the construction of irrigation works, which were described as "national."

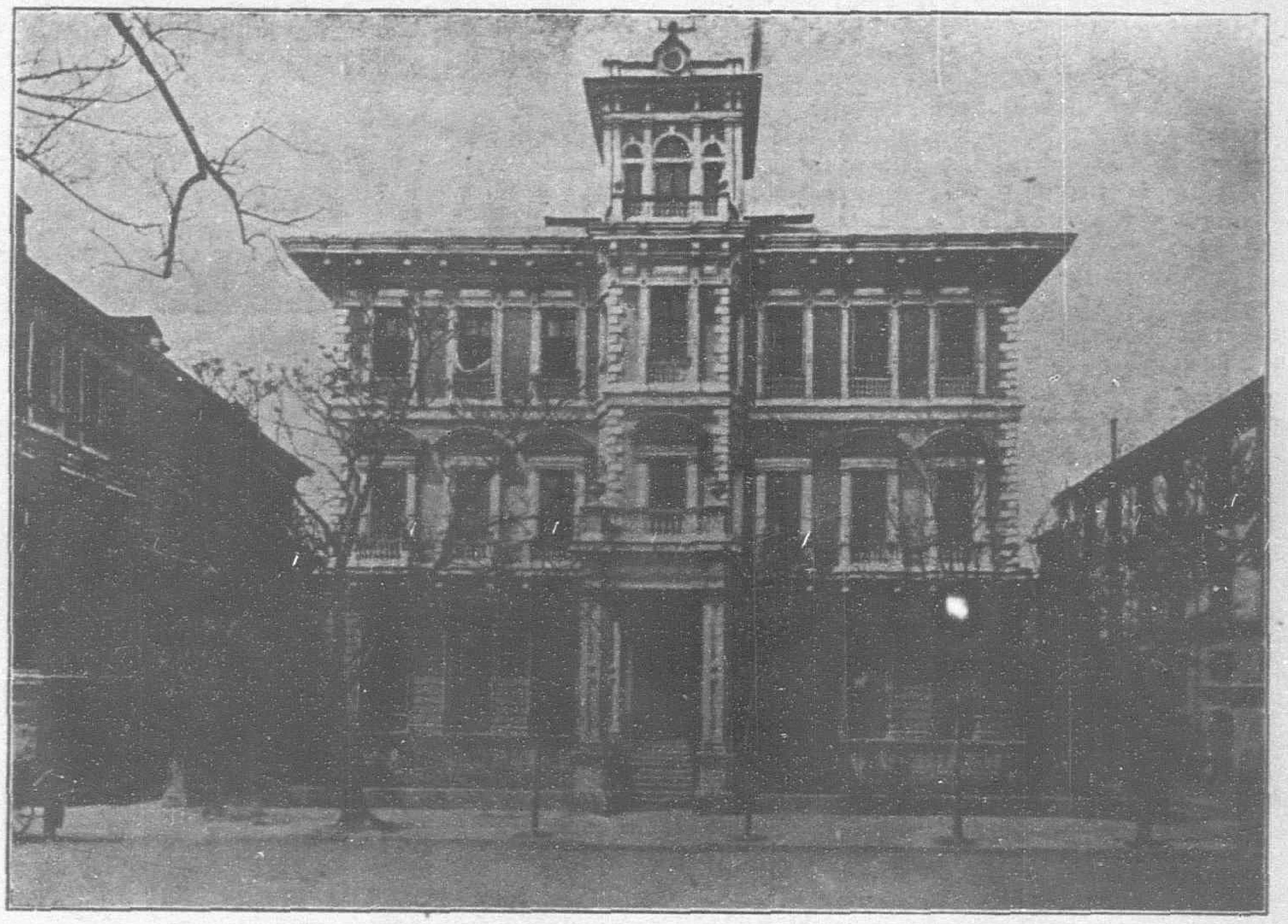
When the time arrived for dealing with the question of bringing the works into operation and of obtaining some return from them, the boom ended abruptly. The irrigation trusts were soon found to be in an unsatisfactory financial position, and there arose a widespread demand for inquiry and investigation. The result was that a Royal Commission was appointed to inquire into the whole subject of irrigation and rural water supply, for in addition to numerous irrigation trusts there was a considerable



HONGKONG AND SHANGHAI BANK, SHANGHAI



GERMAN CONSULATE, SHANGHAI

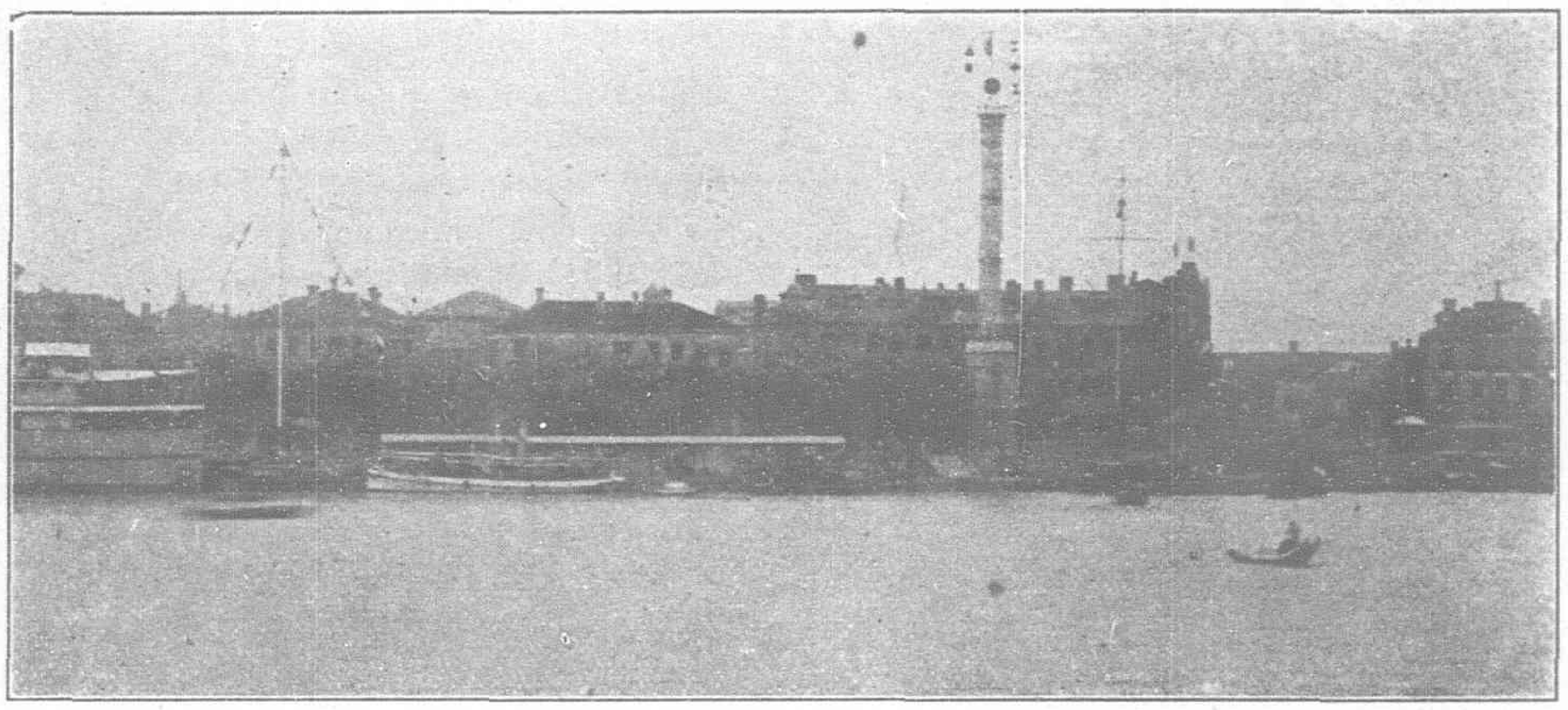


CHARTERED BANK OF INDIA, AUSTRALIA & CHINA, SHANGHAI

number of trusts which dealt only with water supply for stock and domestic purposes. The report of the commission was issued in 1896 and the following extracts will show that the description already given of the state of affairs at that time is fully warranted. In the summary of its conclusions, the commission's report has the following: "It is now 10 years since the Irrigation Act was passed, and the majority of the trusts are seemingly not taking any more active steps for meeting their loan obligations than they were shortly after being constituted. The principal reason for this unsatisfactory condition of affairs is that in the case of many of the trusts there was no justification for their formation, and in the case of others that the works were constructed far in advance of the present requirements of the districts. A contributing cause was that in many instances the cost of the works greatly exceeded the original estimates. Our investigations have led us to the conclusion that the great majority of the trusts never should have been constituted, and never would have been, had the schemes submitted for departmental approval been considered from an ordinary common-sense standpoint." * * * "Unfortunately, however, the public mind was excited at the time, and the gospel of irrigation was preached from one end of the colony to the other. The farmers had been suffering from a cycle of dry seasons, the price of produce was high, and the prospect of insuring their crops against the exigencies of climate by means of irrigation appears to have overruled all prudential considerations. Schemes were hastily conceived, and as hastily carried out The question as to whether the cost of the undertaking would be commensurate with the benefits to be derived therefrom, or whether the land could bear the burden that would be placed upon it, was apparently lightly considered, if considered at all. Trusts have been formed and extensive works constructed in districts where the water supply for irrigation is practically nil." The commission gave a number of instances bearing out these conclusions, and, in referring to the reports of Messrs. Gordon and Black, added: "We are sorry to say that the advice of these experts has been practically unheeded, as apparently not any of their valuable warnings and recommendations have been adopted either by the irrigation trusts concerned, by the department which paid the experts for their reports or by the governments which advanced the money to construct the vast irrigation works of the colony."

It is necessary to explain that the rivers in connection with which by far the greatest expenditure had been incurred up till the period of the commission were the Murray, the Goulburn, and the Loddon. In regard to the last-mentioned river, the report of the commission summed up the position as follows: "Six trusts have been constituted in this district, with a gross area of 274,910 acres. The water available, after making allowance for the demands of riparian owners and the Loddon United Waterworks Trust, and for losses by percolation, is, according to the estimate of the department, only sufficient to irrigate 53,479 acres annually, or about one-fifth of the area comprised within the trust's territories. £222,649 of State money has been advanced to these trusts, and this has been expended in the construction of channels capable of commanding about 217,000

PORTUGUESE CLUB, SHANGHAI



FRENCH BUND, SHANGHAI

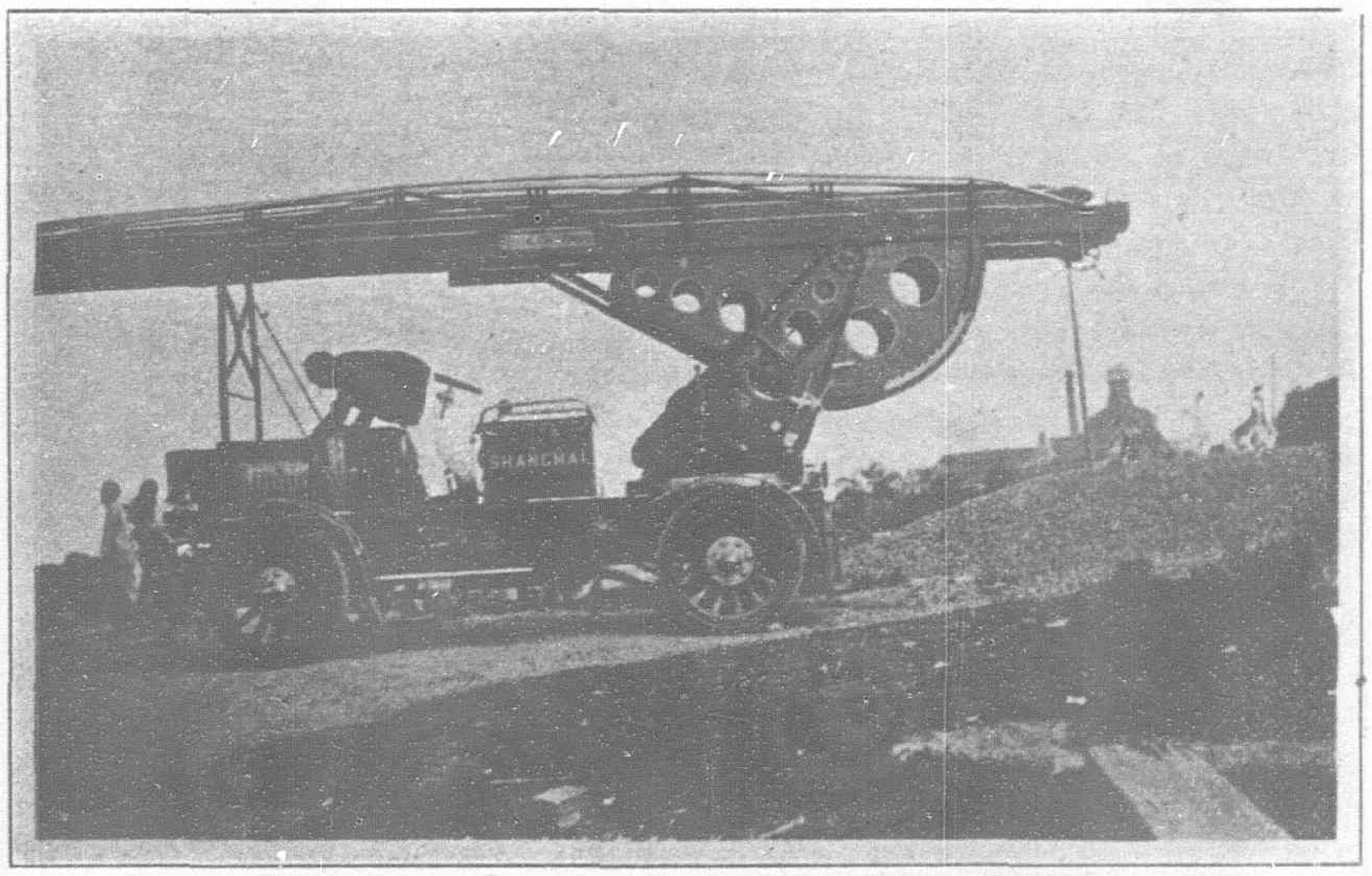
acres. Consequently the great proportion of the money advanced has been absolutely thrown away. The matter does not end here, however, for the six trusts mentioned are debited with £145,000, their share of the cost of the Loddon national works, and are expected to pay £5,800 a year as interest on this liability. The result is that 274,910 acres have been saddled with a liability of £376,649, although, as far as irrigation is concerned, only 53,479 acres can be directly benefited by the expenditure."

Up till the time of the report of the commission in 1896 the amount of loan money expended on irrigation works in Victoria, including arrears of interest, was £1,801,854. The total area irrigated in the year 1895 was only 120,677 acres, and of this area only 50,706 acres was under crops, vines and fruits, the balance being merely pasture land, which had been flooded. Thus, for every acre under crop there had been an expenditure of more than £35 10s, or, taking both crops and pasture land, the expenditure amounted to nearly £15 per acre.

After the issue of the report of the Royal Commission, a period of writing off of capital and interest set in. Up till June 30, 1905, the amount of capital thus written off was £724,776, while the amount of interest written off was £323,733. The outstanding arrears of interest at that time amounted to £12,946. The amount expended on irrigation, through the agency of the trusts, was £1,122,087, while that expended by the government direct on the so-called national works was £969,439. Thus the actual outlay on works up till 1905 was £2,091,526, and the extent of the irrigation due to this expenditure amounted to only 165,656 acres. The figures available do not show the proportion of this represented by pasture land; but even if the whole area was under crops, the result was very poor for such a great outlay, the latter being over £12 12s for every acre irrigated. This is a miserable record compared to what should have been done. There are at least ten of the Western States of America in

FRENCH CONSULATE, SHANGHAI

NANKING ROAD, LOOKING FROM SZECHUEN ROAD TOWARDS THE BUND, SHOWING HALL & HOLTZ BUILDING



NEW TURNTABLE, SHANGHAI FIRE DEPARTMENT

NEW "FIRE KING," SHANGHAI FIRE DEPARTMENT which the area of irrigation is much greater and in some of which it is ten times greater than in Victoria, and in every instance the taxpayer has not been asked for a single dollar of the outlay required. The principle which has been recognized and acted on is that wherever private enterprise is able and willing to carry out irrigation works it should be afforded every facility for doing so. The magnificent result of this policy has been that last year ten millions of acres were under irrigation in the United States.

Within the last year great extensions of the irrigation works of Victoria have been taken in hand, and, at the same time, the late minister of water supply, Mr. Swinburne, passed and brought into operation an Act of Parliament which is probably the most comprehensive measure of its kind in any part of the British dominions. This act places the control of the irrigation trusts, and the whole management of the irrigation works of the State, in charge of three commissioners. For the position of chairman of this commission the Victorian government has had the good fortune to secure the services of Mr. Elwood Mead, who resigned from the position of chief of irrigation investigations in the United States to take up that office. But after 20 years of such engineering and management as was described and characterized by the Royal Commission, it is very doubtful whether even such an experienced engineer and manager as Mr. Mead will be able to place the irrigation works of Victoria on anything like a satisfactory business footing. From the terms of the Water Act referred to, and from the discussion which took place in the Victorian Parliament regarding it, the inference which may fairly be drawn is that from the general taxpayer's point of view the irrigation works must be regarded as a permanent and hopeless failure. Waterworks districts are constituted under the act to take the place of the trusts, and a general rate is to be levied on all lands included in these districts for the supply of water for domestic and stock purposes. The following words of the act, relating to this subject, are of special interest: "Such rate may be made for one year, and shall be of such amount in the pound of the rateable value of such lands as may be necessary to recoup the proportion of interest on cost of works (except such works as are by this act or shall be by some future act of Parliament declared free head works), and of maintenance and management thereof, properly debitable in respect of the service rendered by the works as the commission may determine." In order to make clear the importance of the exemptions here made it is necessary to explain that under the designation of "free head works" are included storage reservoirs, diversion weirs, head works and main canals.

In addition to the general rate for water supply for domestic and stock purposes the commission is empowered to levy a special rate for irrigation in any water district after giving notice in the "Gazette" that such district is supplied with water for irrigation. The land may be subdivided into three classes, according to the facilities for distributing the water, and the rate for the land of the highest class is to be one-fifth of the net annual value, according to the valuation made under the direction of the commission. The cost of the free head works, which are enumerated in the schedule to the act, amounted to £1,068,182, and the further outlay on such works has been proceeding rapidly since the act was passed. The terms "national works" and "free head works" are very convenient in connection with such irrigation works as have been carried out in Victoria during the past 20 years. If the principle involved in these terms were applied to the Sydney water supply works it would be a pleasant change for the ratepayers of the city and suburbs. The Prospect and Cataract reservoirs, the tunnel, canal and aqueduct works, the various service reservoirs and pumping stations, and the main pipes would be classed as "free head works," so that the general water rate would be based only on the cost of reticulation and maintenance. To complete the parallel it would be necessary to have a separate rate for water for the irrigation of gardens. The idea has been put forward that in the distant future the amount raised from rates for irrigation in Victoria will increase to such a degree as to pay interest on the outlay. It is possible, but very improbable, that this hope may be justified so far as regards the expenditure from this time forward, but it would be absurd to expect anything like a fair return on the outlay in the past, considering that much of it was, in the words of the report of the Royal Commission, "absolutely thrown away."

REMARKABLE RECORD IN PHILIPPINE PLACER MINING

The operations of the Paracale Gold Dredging Company, Ltd., for the six months ended December 26th on the Paracale River, Camarines, Philippine Islands, show an average production of $1.00 gold from every cubic yard of dirt dredged during that period. This is verified by the dredgemaster's daily report and corroborated by the statement of the International Banking Corporation. The former shows an actual dredging time of 2735.75 hours with 50,244 cubic yards of dirt handled and the bank statement shows that 2,814.1 ounces of bullion were sold at the smelter for $50,653.80 or approximately $18.00 gold an ounce. This is a trifle over $1.00 gold a yard. The dredgemaster's report covers the period from May 23rd, 1908, to December 26th, 1908, and the Bank's statement covers the period from June 15th, 1908, to January 1, 1909.

Following is the summary of the dredgemaster's weekly reports covering the period referred to:

Week ending:	Actual Dredging Time in hours.	Cubic yds. handled, Bank Measurements.	Yards handled per day.	Time hung up for Repairs.
1908.				
May 30	102½	1400	433	41½
June 6	115½	1733	288	28½
June 13	125	1549	258	19
June 20	116½	1743	290	27½
June 27	117	1683	280	27
July 4	118½	1743	289	25½
July 11	102	1370	228	42
July 18	123¾	2195	366	40¼
July 25	125	2364	394	19
Aug. 1	105¼	1970	328	38¾
Aug. 8 Shut	....	....	....	144
Aug. 15 down	....	....	....	144
Aug. 22 for	....	....	....	144
Aug. 29 re-	....	....	....	144
Sept. 5 pairs	....	....	....	144
Sept. 12	62	1125	188	82
Sept. 19	120½	1955	326	23½
Sept. 26	128¼	3080	513	15¾
Oct. 3	120¾	2464	411	23¼
Oct. 10	75¾	1456	242	68¼
Oct. 17	129½	3173	529	14½
Oct. 24	112	3174	529	32
Oct. 31	97½	2230	372	46½
Nov. 7	112	2410	401	32
Nov. 14	115	2120	353	29
Nov. 21	118	2315	386	26
Nov. 28	127	2426	404	17
Dec. 5	131½	2365	391	12½
Dec. 12	115	2210	368	29
Dec. 19 Restacking..	....	....	....	144
Dec. 26 Tailings	....	....	....	144
Total	2735¾	50244	....	1719¼

* SUMATRAN MINING

Mr. Th. F. S. Delprat, late Chief Engineer of the State Railways in the Dutch East Indies, recently delivered a lecture on "The Mining Industry in Sumatra." The task the speaker imposed upon himself was to show what European industry had accomplished in a limited part of India, and to give an idea of the great financial interests which Holland and Europe have in the Indies.

COAL

Dealing with coal, he pointed out that coal beds are numerous throughout the whole archipelago, both on Borneo and on Sumatra. No attention was paid to these coal beds before 1865, when mining engineer Greve was commissioned to make a geological survey of the West Coast of Sumatra.

The speaker then proceeded to give the history of the Ombilin coal fields, consisting of four characteristic parts. At first it was supposed erroneously that this was a field where coal was on the surface, but, as a matter of fact, this is but an ordinary mine, of which at present only one fourth part is in exploitation.

The Ombilin coals are comparatively of recent origin. They have a great heating capacity and very good properties. A less satisfactory property is, however, that these coals soon become decayed—like the Russian coals. The result is that the coals, which in a fresh condition have a shiny appearance, become, after a comparatively short space of time, dusty or gritty. These coals must be used quickly after they have come out of the mine; they are not suitable for the formation of large stores for the Navy or steamship companies.

In order to remedy the great drawback of this excessive quantity of grit, a briquet factory has been established. In 1901 the amount of coal used in the archipelago was 350,000 tons. The great competitors of the Ombilin coals are the Japan and Cardiff coals.

The financial result has not been unsatisfactory. Emmahaven had to be built, and a heavy railway from Padang to the highlands had to be constructed; an aggregate of 23 to 24 million guilders had to be invested in these coal fields. Nevertheless lately a net profit of 745,000 guilders (£62,083) was obtained. At present eighty-five Europeans are employed on this field.

Mr. Delprat expressed his appreciation of the work done by forced laborers. His opinion of the Chinese laborers, who were sent to the mines in a poor state, was less favorable. Gradually a change had been made in replacing the Chinese by free Japanese laborers, who receive f. 70 (£5 16s. 8d.) per man, and who enter into contracts for a stipulated time. At present there are employed on these fields 1,500 or 1,600 men under contract, and about 1,500 men who work without any contract, but at their own free will. Women have also been sent for, with the result that now a little town with factories, houses, a school, a prison, etc., has been built in a large uninhabited region.

GOLD

It was known to the ancients that much gold was in existence in the Indies, but it is only a short time since that the interior of Sumatra has been penetrated. Since 1879, however, by great effort and expenditure, the difficulties which hindered an exploitation of the gold mines at Benkoelen has gradually been mastered. The speaker referred more particularly to the results of the Redjang Lebong mine, the f. 100 shares of which at present represent a value of f. 1,045. It is much to be regretted that the Salida mine ("M.J." October 20, 1906, p. 458), which was worked a long time ago by the East India Company, but which they abandoned without any definite reason, is at present not in exploitation.

The speaker had no time left for the discussion of the petroleum industry at Palembang and in the Residency of the East Coast of Sumatra. As among those present there were a number of speculators interested in the gold and petroleum industry, this was greatly deplored, especially by the shareholders of the Koninkbyke Exploratie Maatschappy. Mr. Delprat, however, proposed to the meeting to devote to this subject a special lecture, which proposal was received with great applause.

F. M. S. TIN OUTPUT FOR APRIL

	Piculs.		*Piculs.*
Belat	720	Pengkalen	400
Bruseh	320	Pusing Lama	669
Gopeng	550	Rambutan	335
Kanaboi	267	Redhills	600
Kinta	410	Royal Johore	102
Kuantan	73	Sempam	54
Lahat	574	Serendah	295
New Gopeng	141	Sipiau	115
Pahang		Tekka	500
Consolidated	1764	Tronoh	2410

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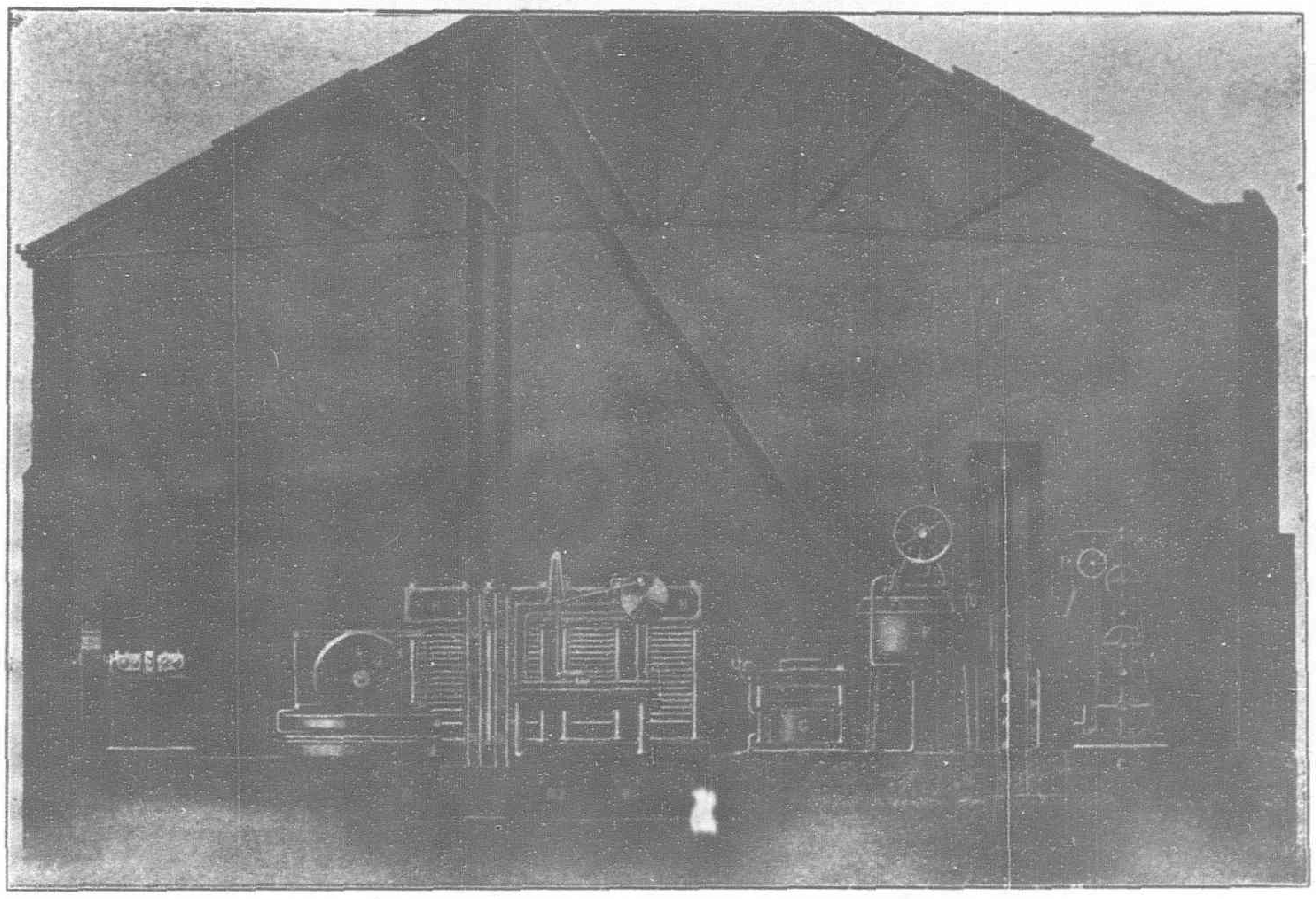
* Translated from "De Indische Mercuur" for "The Mining Journal."

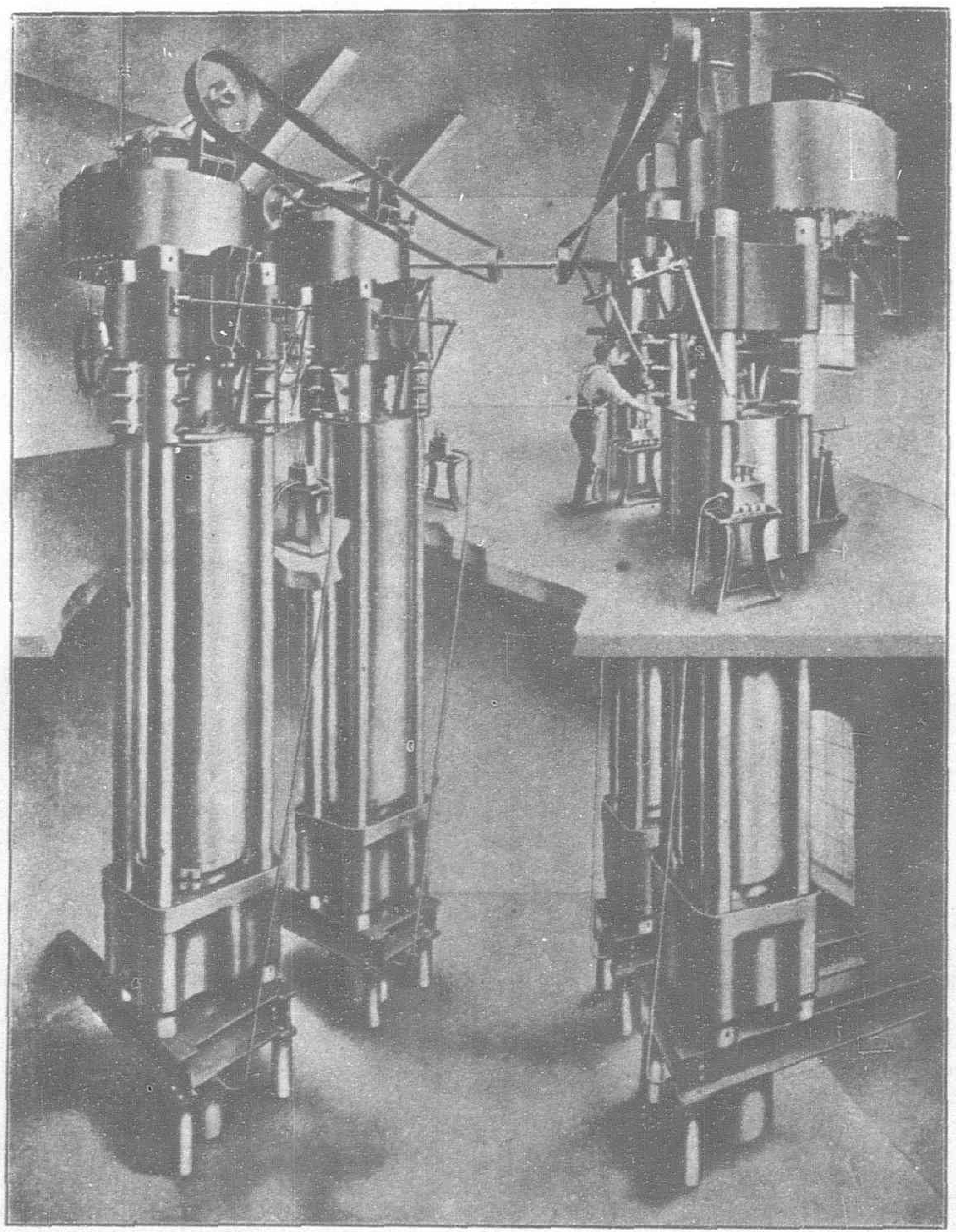
MODERN OIL MILLS

With Notes on Dredgers, from the Works of Rose, Downs, & Thompson, Ltd.

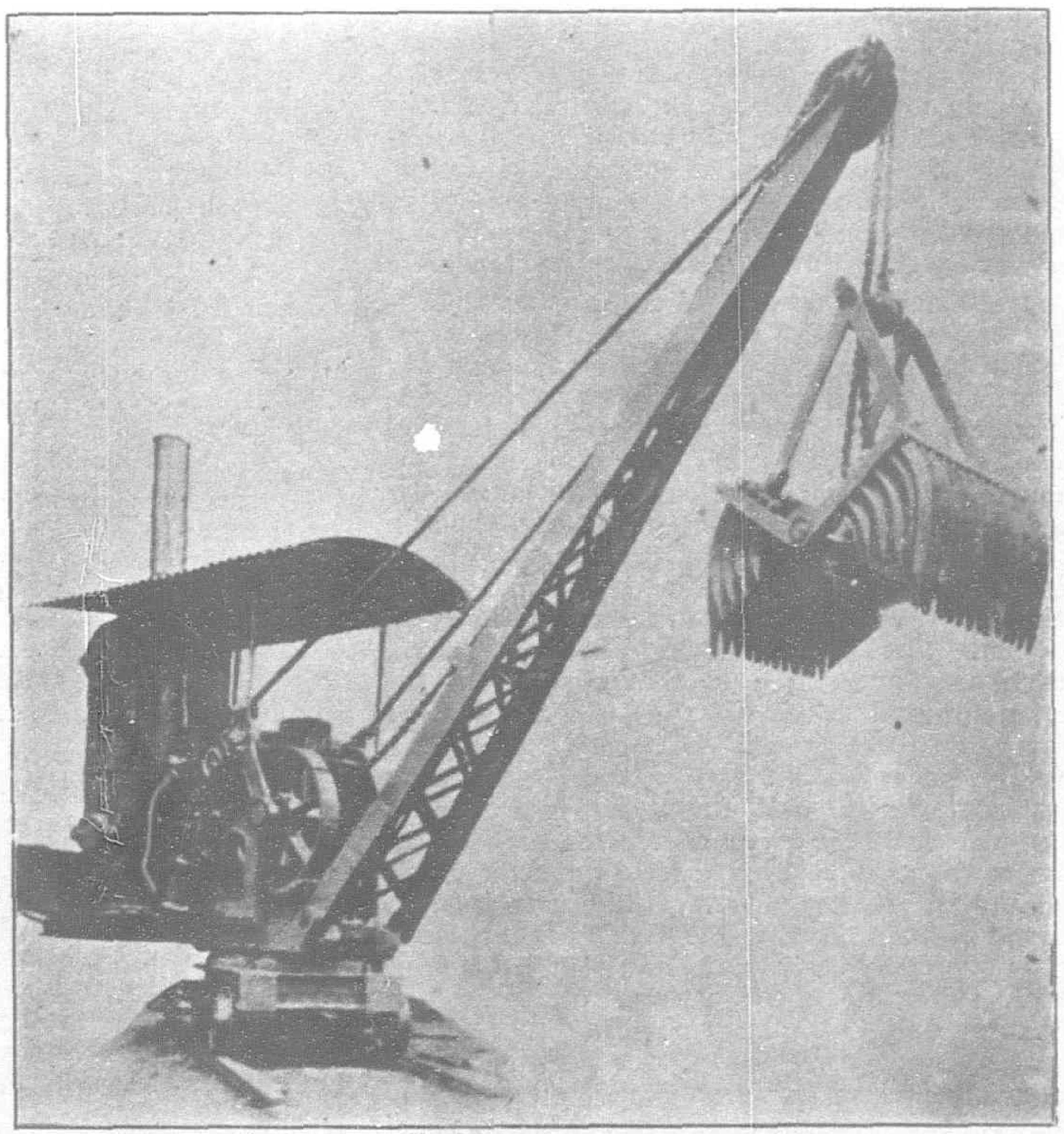
The fact that the various countries which pass under the designation "THE FAR EAST" form one of the richest fields in the universe for the cultivation of all manner of oil-bearing seeds, beans and nuts is so generally recognised as to require no further comment. In the equatorial districts we find cocoanut and sesamum; in the middle regions cotton, groundnut, castor, sunflower; in the north, the China bean, rape and linseed. Although the peoples of the Orient consume huge quantities of these seeds and nuts in the production of oil for food purposes, yet so great is the production of seed, that many thousands of tons of these valuable materials are shipped to home markets for treatment there. As can be well imagined, the natives of the East extract the oils by means of apparatus of great antiquity, entailing much manual labor, the utilization of an excess of ground space, and the methods adopted result in a great proportion of extractable oil being still left in the residue. With the object of introducing the modern and consequently economical machinery in use at home into the East, the British firm of ROSE, DOWNS & THOMPSON, LIMITED, of HULL and LONDON, have established a branch of their business in Shanghai. This firm has been established no less than 132 years, and are probably the largest as well as the oldest specialists in modern OIL MILL MACHINERY. However, experienced engineers in the East may be—and without a doubt there are some of the most capable men in the world engaged upon the various enterprises in the East—yet it cannot be expected that they should be experts in this very important branch of engineering, since almost every different seed and nut requires its own special treatment, involving various combinations of plant, in order that the highest possible percentage of oil may be obtained; and the firm under review believe that in establishing their Eastern branch, they will be of great assistance to the numerous houses situate and doing business in the East, in educating the natives to the value of modern appliances, through the medium of these merchants. The Oriental is very slow to combine in the formation of joint-stock concerns, and this fact calls into requisition small installations, requiring little outlay, and Messrs. Rose, Down's & Thompson, Ltd. recognised this fact early, and they supply complete plants for the economic treatment of seeds from a total inclusive price of £85 up to £30,000 and even higher.



(4 PRESS) ANGLO-AMERICAN OIL MILL.

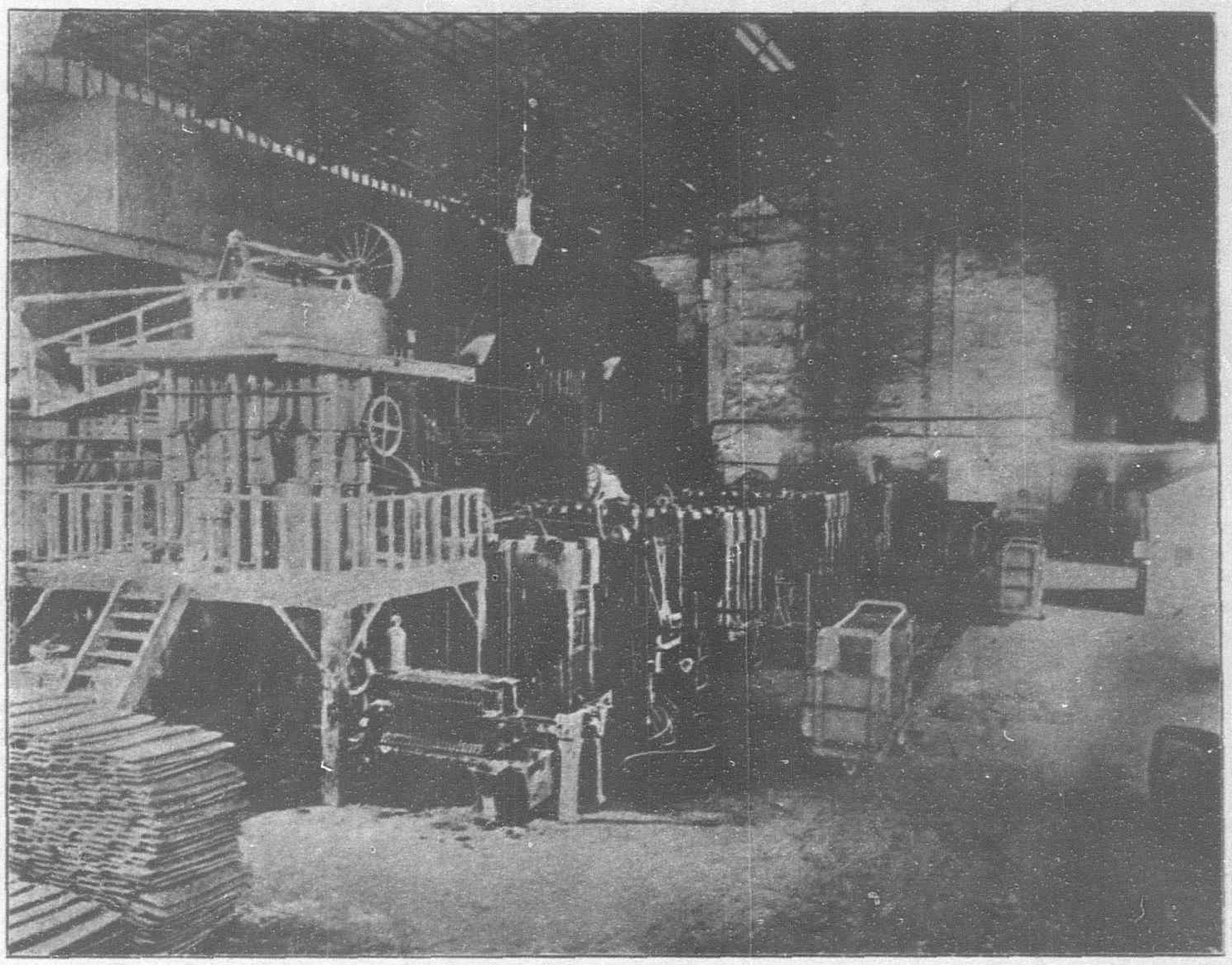


2 PAIRS OF "PREMIER" HYDRAULIC PRESSES



"KINGSTON" LOCOMOTIVE EXCAVATOR

The Anglo-American process of oil-extraction, which is universally recognised to be the standard system, was the invention of this firm, and this system is in use now in almost every civilized country in the world. The illustration first shown represents a complete Oil Mill working on this system. The process is as follows:—the seed is first rolled or crushed through a series of chilled rolls, thus breaking all the oil cells of the seed so as to permit the escape of the oil when the seed is under pressure. From these rolls, the seed is automatically conveyed to a Kettle. This is an apparatus provided with a steam jacket and also an appliance for injecting live steam amongst the crushed seed. This process is called cooking or tempering. The hot seed



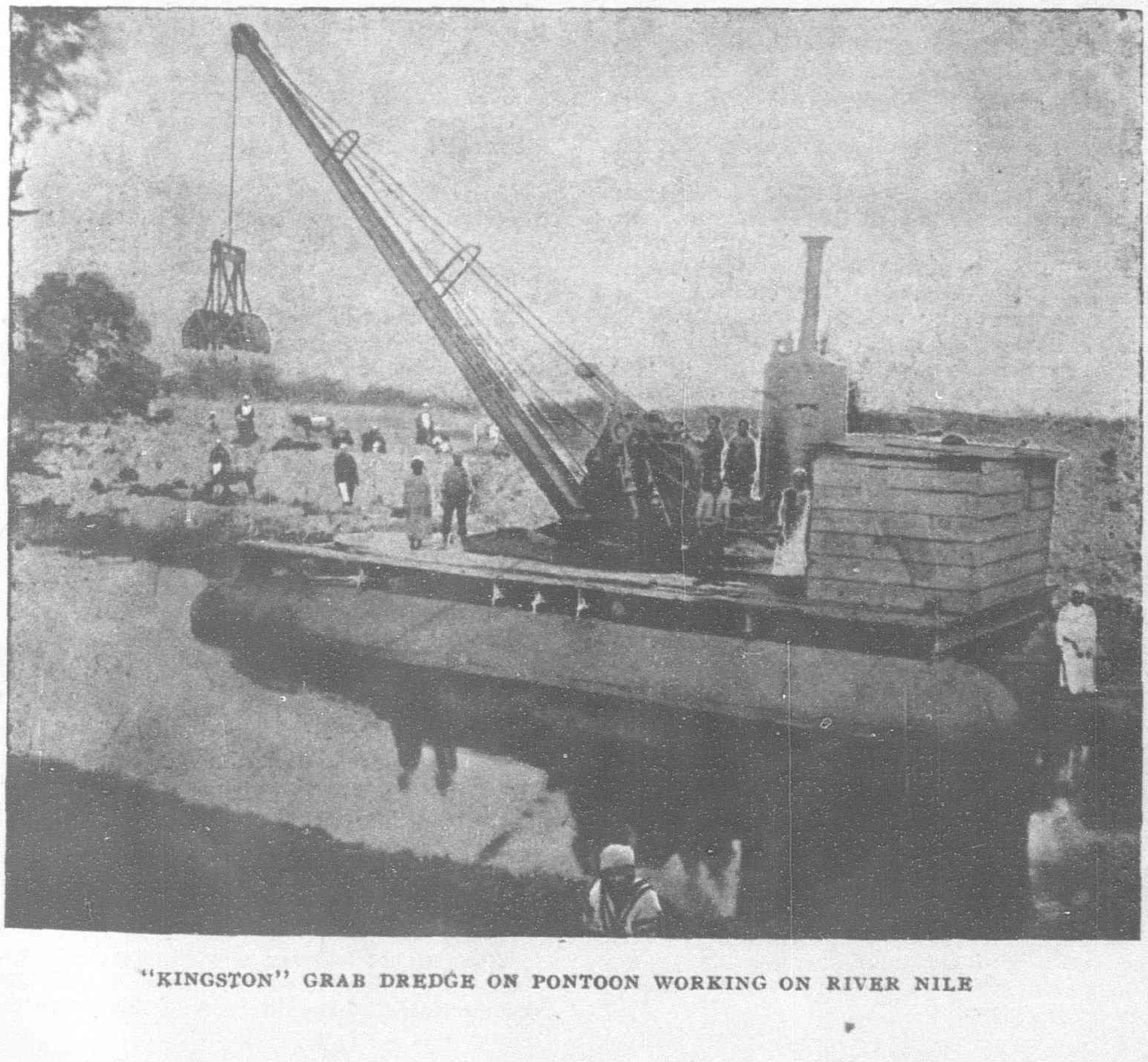
INTERIOR OF LARGE OIL MILL IN EGYPT

is then drawn from the kettle, given a preliminary pressure in a moulding machine, in order that the press may admit the maximum amount of material and the moulded meal is then placed in the hydraulic press. When the press is fully charged, the pressure is applied by means of suitable hydraulic pumps and the oil is extracted. As the oil flows from the seed, it is pumped away to storage. The press is then emptied and recharged, the residue being in the form of cake. As a rule four Anglo-American Presses are worked together and form one set, and one gang of men are capable of keeping these four presses fully at work. This is the system followed when the small and simpler forms of seed are treated, such as linseed. For the other seeds, special processes are necessary, either in the preliminary working, or the subsequent operations. Many of the oil-bearing materials contain a very high percentage of oil, as for example cocoanut (copra), sesamum, castor, etc., and in order to recover all the available oil, it is essential that these be pressed twice. The first pressing may be conducted hot or cold, according to the quality of oil that is desired, cold-drawn oils of course being of a higher value. The first pressing as a rule is made in what are termed at home "Clodding" Presses, and we show an illustration of probably the largest presses known for this work. These presses represent the most up-to-date form of clodding of first-pressing presses. They are of most massive construction, and work at a pressure up to 3 tons per square inch of the ram. Probably our readers would be interested in a brief description of these Presses. On the top will be noticed the Kettle, in which the seed is tempered. (If the seed is to be pressed cold, then steam is not called into requisition.) Immediately underneath the kettle is a unique device for accurately measuring the quantity of seed to form one cake. By means of a forward and backward movement of a lever, the seed is drawn from the kettle, accurately measured, and fed to the press. A series of these movements thus charge these huge presses, each cake being separated from the next one by means of a steel plate. The extracting box or cake chamber is built up of steel bars having numberless perforations for the escape of the oil. The perforations are tapered, and thus no blocking up from the inside can take place. The bars in question are held in position by means of massive weldless steel rings, of ample strength for withstanding the working pressure. Towards the base and in the cylinder casing is a trough for collecting the oil as it is expressed. The hydraulic cylinder at the base of the press is constructed of cast-steel. When the operator has filled the press in the manner described, a loose head is run in taking up the opening above the cake box, and pressure is applied. As the oil leaves the seed, it is passed through the perforations, and drops down into the trough, and is forthwith pumped away to storage. This type of press has been specially designed for the treatment of the more oily classes of seed and nuts, and the cakes resulting from this pressing are broken up, reduced to meal again, and pressed again, either in similar presses or in presses of the Anglo-American type previously described. It might also be mentioned that a modification of the clodding or "Premier" press (as it is called by the manufacturers) is suitable for the production of the large round Bean Cakes so much in evidence in the north. The following illustration shows a large Oil Mill installation supplied by the firm in question to Egypt, and in the foreground will be seen a set of Premier Presses, with Anglo-American Presses filling the background. Messrs. Rose, Downs & Thompson are specialists in the manufacture of every type of machine and appliance not only for the preliminary treatment of the seed and the expression of the oil, but in addition they make all types of apparatus for the after-treatment of oils, such as refineries, filters, oil boilers, clarifiers, bleachers, etc.

Machinery for the extraction of fish oil and appliances for the conversion of waste fish and fish offals into manure are also specialities of this firm.

They also manufacture installations for the production of cattle feeding cakes from non-oleaginous cereals, spices, etc. This form of food for cattle is very popular at home, especially during the winter months when the cattle cannot graze in the fields, and Messrs. Rose, Downs & Thompson have made the bulk of this class of machinery at present in use.

We also beg to call our readers' attention to the KINGSTON GRAB DREDGER and EXCAVATOR as shown in the accompanying illustrations. Messrs. Rose, Downs & Thompson, Ltd., are the sole manufacturers of this very useful appliance, for which there is a good demand in the East. This Dredger is particularly adapted to the following uses:—Dredging, deepening or cleansing harbors, rivers, canals, etc. Excavating new harbors, docks, railways and canals. Cutting trenches and laying pipes for sewerage purposes. Reclaiming waste lands. Top stripping mines. Sinking cylinders for bridges and piers. Laying concrete under water. Lifting wreckage, broken rock, concrete and bulk cargo. Discharging coal, sand, gravel, granite, ballast, lime, grain, etc., and it can be employed as an ordinary crane. This Dredger is made in various types, such as locomotive, portable and fixed, the latter suitable for bolting to the deck of a vessel, and the four sizes in which it is made have capacities varying from 30 tons to 120 tons of spoil excavated per hour. The Dredger is exceedingly simple to manipulate, one man being sufficient to attend to the whole of the requirements of one dredger, and the makers



"KINGSTON" GRAB DREDGE ON PONTOON WORKING ON RIVER NILE claim for it many advantages over other existing dredgers and excavators of a similar nature. The grab can be worked to any depth, and can be used in odd corners or close alongside quay walls and amongst shipping, a decided advantage over the endless bucket type of dredger. Further, this machine is specially adaptable to working in shallow water and can, if desired, cut its own flotation The outlay for repairs is very trifling and instances are known where the cost of excavation including fuel, oil and waste, driver's wages, depreciation, repairs and renewals, interest on capital outlay, etc., do not exceed one penny per ton of material dredged. Further, the Dredger can be mounted upon any existing vessel or pontoon, and does not require a special vessel as does the bucket dredger. It is shipped in handy pieces and can be erected and put to work by any ordinary mechanic.

As we have previously mentioned, Messrs. Rose, Downs & Thompson, Limited, are now permanently established in the East, and any enquiries our readers may direct to them at 13, Nanking Road, Shanghai, will be attendde to immediately, and catalogues, estimates and all other information, that may be required, are at the disposal of anyone interested in the very important specialities manufactured by this firm.

PACIFIC TANK COMPANY

During the past few years there has been considerable change in the construction and hooping of Water, Oil, and Mining Tanks. The early methods provided for Tanks with tapered sides and driven hoops, hoops being riveted together and driven to place by the means of sledge and hoop set. The later and more modern method, however, has changed this construction, and practically all Tanks, especially on the Pacific Coast, with the possible exception of Tanks for the storage of Wine, are now manufactured with straight sides, and fitted with round soft steel hoops. These hoops are provided with a cold rolled up-set thread, each hoop being made in two or more sections and each section fitted with a malleable iron inline lug, which allows the hoop to be drawn in a parallel line.

The advantages of the new over the old method of Tank construction are that greater capacity can be procured without increasing the diameter of the Tank. In case of shrinkage or leakage, the hoops can easily be adjusted and the Tanks again made perfectly tight by screwing up the nuts on the rods at each lug, while in the old method, it was necessary to drive the hoops and often after a year or two's use, especially where they were once allowed to dry out, as in the case of wine making and storage Tanks, it was necessary to cut the hoops, re-rivet them, and then drive them to their original position. Another advantage of the round hoop over the flat is that it does not deteriorate as fast as the flat hoop as there is less metal exposed to the air.

It might be interesting to the readers of this paper to know that the Company's products are shipped to all known mining districts of the world. The Republic of Mexico being a near neighbor and a highly mineralized country takes a large portion of the manufactured product from their extensive mills located at San Francisco, California. Water, Oil, and Mining Tanks thickly dot nearly every state in the Mexican Republic, particularly the States of Sonora, Chihuahua, Durango and San Luis Potosi.

Costa Rica's demands are heavy, as well as Chili's and Peru's. The mines in the latter countries have long been worked by primitive methods, and large dumps of ore as well as many mines have been abandoned as the values were too small to pay for handling the material by the old methods, but now that new methods and the comparatively late success of the recovery of gold and silver values by the Cyanide Process have proven so efficient, the demands for the process have necessitated the shipment of a large number of Wooden Tanks (principally used for the process on account of their special adaptability for cyanide solutions) into these Spanish speaking countries. Their trade also extends into Nova Scotia, New Zealand, and South Africa, where the great value of the California Redwood Tank is known. Even the Philippine Islands, one of Uncle Sam's newest possessions, is calling for Redwood Tanks, while the Hawaiian Islands has been a good customer for years.

The Railroad development in China has created a demand for track Water Tanks, and the Pacific Tank Company have recently shipped a great many Tanks for this purpose into China, and consider the Chinaman a reliable and good man to do business with.

In addition to the large Tank Factory at San Francisco, the Company also have Plants at Olympia, Washington, and Los Angeles, California, but practically all their export trade is handled from the San Francisco Factory.

THE PAYNE BILL

The Payne Bill now occupying the attention of the United States Congress is the all absorbing question among the representative commercial bodies interested in Philippine trade with especial reference to the section which provides for free trade between the United States and the islands. So far it would seem that most of the opposition against the free entry of sugar and tobacco has been overcome and there is no reason to believe that the free interchange of the products between the United States and its dependency would not be approved by both houses with very little amendment.

This legislation would mean changing the Philippines from its present status, which is practically covered by the term "open door" to one of preferential trade relations with the United States. The foreign traders, who have built up trade with the islands on a basis of equal opportunity, are naturally interested in the outcome since it places them at a disadvantage with the American manufacturer, should the provisions of the bill affecting the islands become law. The measure of this disadvantage and its possible injury to foreign trade under the proposed bill is a matter of much difference of opinion.

Then there is the revision of the Dingley Tariff included in this most important legislation which must be considered in its relation to that part of the bill affecting the Philippines. As must be recognized, the American Congress has more interest in the revision of the Dingley Tariff than in the free trade feature of the Payne Bill. Indeed the main fight in Congress is on the revision of the Dingley Tariff and it is so intense that unless the trend to revise upward on the part of the Senate is not abandoned, there is reason to believe that the President will be obliged to veto the bill as evidence of his sincerity when he made his campaign promises regarding an early revision of the tariff downwards.

After the Senate completes its disfiguration of the original bill and it is referred back to the house for more manipulation, it will then go to conference. It is at this stage that every effort will be made by the President to have the bill fulfil the pledge of the administration. If he fails, then there is no other course for him to pursue than to use his veto power.

With this ending to the proposed legislation would go the prospect for some time of free trade between the United States and the Philippines, and therefore the present status of the "Open Door" would continue. And from indications, the prospect for the passage of a bill fulfilling the pledges of the administration is very remote at this writing.

Therefore, the Colton Bill which provides for a revision of the tariff now in force in the Philippine Islands is the measure that is immediately engaging the attention of American and European importers. There is no reason to believe that it will not become law in amended form, but until it goes on its final passage, the importer will be obliged to use the greatest discretion in his orders. The latest news from Washington is to the effect that the Colton Bill will become law about July 15 and that an amendment has passed the house making it effective sixty days after its passage. This amendment also provides that goods placed in bond prior to effective date may be withdrawn under new law. This relieves the situation and gives time for an adjustment so that the importers may minimize possible losses. The original bill provided that it would be effective on its passage.

FAR EASTERN COMPANY REPORTS

Selangor Rubber Co., Ltd.—This company has paid a dividend of 75% after writing off £1,000 for depreciation, placing £2000 in the reserve and carrying forward £2000.

The Ta Ching Government Bank.—The report of this institution covering the third year's profits was as follows:

Peking Office	Tls. 397,831.26
Tientsin	183,159.33
Shanghai	258,822.23
Hankow	122,728.46
Chinan	23,639.22
Changchikow	21,419.36
Mukden	620,302.91
Yingkow	314,377.72

After deducting current expenses and adding on the balance brought forward from last account, it shows a credit balance of Tls. 1,512,548.-73 which it is proposed to deal with as follows:

Amount to be brought forward to next year, Tls. 21,336.62; amount remains for appropriation Tls. 1,491,212.11,. from which, in accordance with the memorial sent to the throne last year by the Board of Revenue, 20 per cent (Tls. 298,242.42), to be appropriated towards reserve funds; 2 per cent from what remains for remuneration for the management (Taels 38,593.93.) A dividend of 24 per cent per annum on old shares and 15 per cent on new shares to be paid.

The Star Ferry Co., Ltd.—The net earnings for the year amounted to $38,563, of which the following disposition was made: Repairs and Insurance account, $11,792; dividend of 10 per cent, $15,000.00; write off boats, $10,000.00; carry forward to new account, $3,121.43—$28,121.43.

Watkins, Ltd.—The net profit for the year was $12,000 and dividend was passed with promise for better results next year.

A. S. Watson & Co, Ltd.—At the annual meeting May 29th a final dividend of 30 cents was declared, making 60 cents for the year.

The Linggi Plantations, Ltd.—A final dividend of 40% making 60% for the year was the result of the year's work. Besides this £4,000 was placed in the reserve and £1,000 carried forward out of the year's profits.

The Federated Malay States Rubber Co., Ltd.—An interim dividend of 6% has been declared by this company.

The Consolidated Malay Rubber Estates Co., Ltd.—This company declared a final dividend of 12.5% making 17.5% for the year and carried forward £1,153 for the year.

Highlands and Lowlands Rubber Estates, Ltd.—This company paid a final dividend of 10% making 15% for the year with £6,000 forward.

The Anglo-Malay Rubber Co., Ltd.—This company has declared a final dividend of 20% making a total of 30% for the year and carried forward £12,571.

The Langkat Sumatra Rubber Co., Ltd.—This company paid a dividend of 5% for the year.

Simo Rubber Estates, Ltd.—This company has paid a dividend of 8% and carried forward £1,253,10s.

Japan-China Steamship Co.—The profit for the term amounted to yen 100,000, out of which the directors recommended the payment of a 2.5% dividend.

The Netherlands Trading Society.—This bank has declared a dividend of 8% for the year 1908.

The Tebong Rubber and Tapioca Estate, Ltd.—A dividend of 6% for the year 1908 was recommended by the directors of this company.

Golden Hope Rubber Estate, Ltd.—This company paid a dividend of 8% and carried forward £2,171.

Georgetown Dispensary, Ltd.—This company paid a dividend of 12.5% for the year.

Peak Tramways Co., Ltd.—This company paid a dividend of 8%, and added $15,000 to the reserve.

The Canton-Hankow Railway.—The followlowing is the report of the railway for the year 1908:

Month	No. of Working days.	No. of Passengers carried.	Gross Receipts dollars.
1st Moon	30	89,447	9,775.78
2nd "	29	76,972	10,615.34
3rd "	29	88,767	13,447.80
4th "	30	73,854	10,966.26
5th "	27*	99,915	13,729.07
6th "	29	68,026	10,427.40
7th "	30	78,047	12,276.63
8th "	29	97,915	14,731.74
9th "	30	89,263	14,032.06
10th "	30	93,019	15,499.32
11th "	29	96,924	18,881.42
12th "	30	119,217	22,809.87

(* Service suspended on the 23rd, 24th and 25th days on account of the flood.)

It will be seen that 1,071,726 passengers were carried during the year and the gross receipts amounted to $167,202.69. Out of this, wages, etc., absorbed $39,825,948 leaving a credit balance of $127,376.742, which, with $619,254 from the previous year's account, $228.52 from the Works Department on subsidiary coins, $42.80 from the passengers for breaking windows, etc., and £15 rent of ground at Wangsha, makes the grand total of $128,282,316.

The sum of $128,000 has been transferred to the General Account and the sum of $282,316 is left as working expenses.

The Varadero de Manila.—The following is the balance sheet of the company submitted for the year 1908:

RESOURCES

Plant	₱546,162.61
Small boats and launches	27,525.66
Bills receivable	114,861.68
Machinery in course of construction	8,433.59
Warehouse	225,845.07
Lorchas	10,095.26
Shares on deposit	13,500.00
Cash on hand	12,600.62
Total	₱959,024.49

LIABILITIES

Capital Stock	₱450,000.00
Depositors of Shares	13,500.00
Reserve fund	119,845.23
Voluntary reserve fund	165,667.86
Loss and Gain a/c	134,000.39
Bills payable	46,712.98
Mortgages	250.00
Dividends Pending	13,348.50
Due Banco Español-Filipino	15,699.53
Total	₱959,024.49

The Shanghai Electric and Asbestos Co Ltd.—The following is the report of the directors, submitted at the annual meeting for the year:

The profit and loss account shows a net profit for the twelve months of $20,361.40 which, with the amount carried forward from last year, viz., $2,657.68, gives a total of $23,519.08. This sum your directors propose to allocate as follows:

Pay a dividend of 8 per cent	10,000.00
Add to Reserve Fund, this bringing same up to $15,000.00	5,000.00
Increase reserve for doubtful debts, making the reserve fund under this heading $5,500.00	2,500.00
Write off Furniture and Fixtures for depreciation	838.33
Write off Steam Launch *Electric* for depreciation	1,500.00
Carry forward to next year's working	3,680.75
	23,519.08

Directors.—Mr. W. C. Murray retires by rotation, but is willing to serve again if re-elected.

Auditors.—The accounts have been audited by Messrs. A. R. Leake & Co. now amalgamated with Messrs. Lowe, Bingham and Matthews, who offer themselves for election as Auditors for the ensuing year.

W. D. Little, *Chairman.*

The annual meeting of the Shanghai Electric and Asbestos Co., Ltd., took place yesterday afternoon in the Company's office No. 11a Nanking Road. Mr. W. D. Little presided and the others present were Messrs. J. Frost, A. Hide, W. C. Murray, Directors; R. W. MacCabe, Secretary; O. L. Ilbert, Thomas Weir, E. W. Clement, and H. Browett.

The Chairman said:—

We recommend a dividend of 8 per cent, the same as last year. I regret, however, that you have had to wait for this instead of receiving a portion by way of interim dividend after the usual half yearly balance, as heretofore, but at that time we had a heavy overdraft with our Bankers. You will see from the account that at the end of the year we had worked to a credit; however, at the moment we are again overdrawn. The fact is with a growing business we want a little more working capital.

The company was started in 1903 with a capital of $100,000; on the 14th July, 1904, an extraordinary general meeting passed Resolutions to the effect that the capital be increased to $200,000 by the creation of 4000 new shares but that only 1000 of such shares be then issued, the remaining 3000 to be issued and disposed of by the board from time to time and upon such conditions as the Board in their discretion shall deem advisable. Our paid-up capital is now $125,000; we propose to issue as soon as the time is propitious a further 1000 shares bringing the capital issued up to $150,000. The necessity of carrying considerable stock absorbs our funds. I referred to this position last year and trusted that we should be able to reduce the amount so locked up but unfortunately that does not seem possible. For our stock you will observe is valued at a sum just slightly in excess of our capital. We recommend placing $5000 to reserve, bringing that account up to $15,000, and that certain amounts be written off various accounts as detailed in the Report.

During the six years of the Company's existence to February 28, 1909, we have paid away:

Dividends	$54,549.50
Bonus to Staff	7,000.00
Created a Reserve account of	15,000.00
A special reserve for bad and doubtful debts of	5,500.00
And written off various accounts	22,329.45
	$104,378.95

which shows, I think, a satisfactory working. We had a set back in 1906 owing to the defalcations of the Secretary at that time. For the year ending 31st March, 1907, we had to pass our dividend but wrote off the whole of the late Secretary's defalcations and the expenses connected therewith, amounting to $7,757.46 and carried forward to the new account $2,326.98. We are now in new premises in a most suitable location for our business and with, I hope, a good year before us.

There were no questions asked and the first resolution, proposed by the Chairman and seconded by Mr. Murray, that the report and statement of accounts as printed be adopted, was put to the meeting and carried.

Mr. Clements moved that Mr. Murray be re-elected a Director of the Company and that the appointment of Mr. A. Hide as Director be confirmed. Mr. Ilbert seconded.

In regard to this resolution Mr. Little explained that they asked authority to confirm the appointment of Mr. Hide who had been invited by the Directors to take the seat on the board vacated by Mr. E. C. Pearce some six or seven months ago when he went home. He took this opportunity of thanking Mr. Pearce on their behalf for the work he had done for the Company.

The resolution was unanimously carried.

Mr. Browett moved the appointment of Messrs. Lowe, Bingham, and Matthews as auditors of the Company for the current year, which was seconded by Mr. Ilbert and agreed to.

The meeting concluded by a vote of thanks to the Directors and staff for the good results of last year's working, which Mr. Browett proposed.

The Pataling Rubber Estates Syndicate.—At the recent annual meeting this company authorized a final dividend of 32.5% making 45% for the year. Larger dividends are in prospect for the coming year.

Sandycroft Rubber Co., Ltd.—At the fifth ordinary meeting of this company a dividend of 25% was directed paid, $20,000 placed in the reserve, $650 transferred to employees' bonus account, and a balance of $1,275.77 carried forward.

The Shinagawa White Brick Company.—The following accounts were submitted and distribution of profits made at the last half-yearly meeting:

Net receipt	21,677
Brought from previous accounts	1,910
From reserve	11,000
Total	34,587
To legal reserve	1,100
Bonus	1,500
Dividend (10% per annum)	31,250
Carried forward	737

The Tobu Railway Co.—The following accounts were submitted and distribution of profits made at the last half-yearly meeting of this company:

	Yen
Net receipt	94,247
Brought from last balance	23,706
Total	117,953
To reserve	4,750
Dividend (7% per annum)	92,750
Carried to next account	20,453

National Bank of China, Ltd.—The gross profits of this institution, including $10,223 brought forward from former term, amounted to $265,389. After deducting all charges there was $180,552 available out of which $150,000 was placed in the reserve and the balance carried forward.

Hoden Oil Co.—The following report was submitted and distribution made at the last half-yearly meeting of this company:

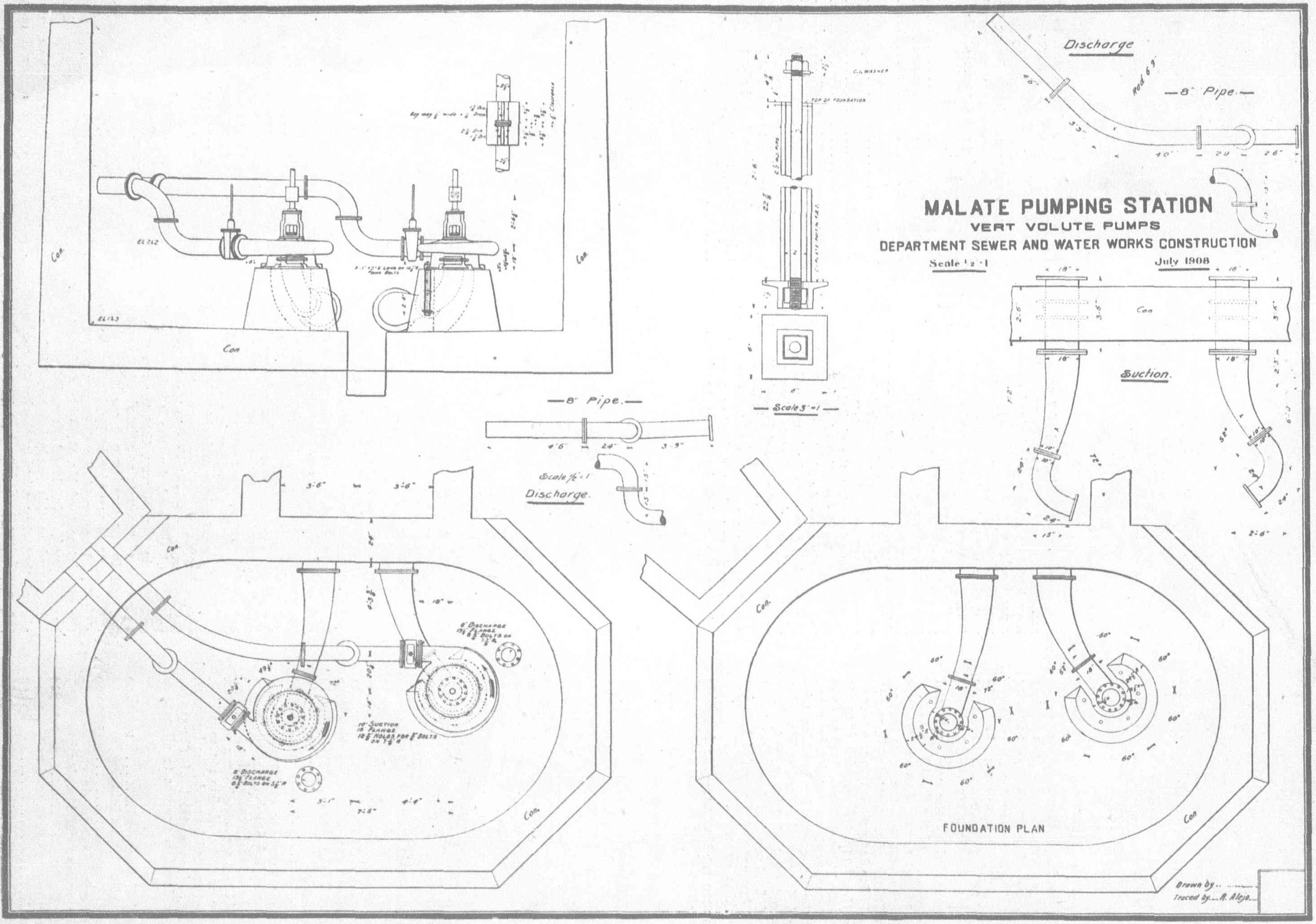
	Yen
Total receipts	2,398,429
Disbursements	794,013
Net profit	1,604,416
Carried over from previous account	300,301
Total	1,904,717
To legal reserve	100,000
Sinking fund	100,000
Dividend to shareholders (30 per cent per annum, viz. yen 7.50 per old share; yen 3.70 per new share)	1,372,500
Bonus to staff	75,000
Carried forward	257,216

The Minomo Arima Railway Co.—For the last half year this company has paid a dividend of 5% per annum.

Meiji Fire Insurance Co.—Of yen 220,458 available a dividend of 20% was paid the shareholders, yen 5,200 awarded bonus to the directors and the remainder carried forward.

The Hanshin Electric Railway Co.—This company has paid a dividend of 12.5% per annum for the last half year.

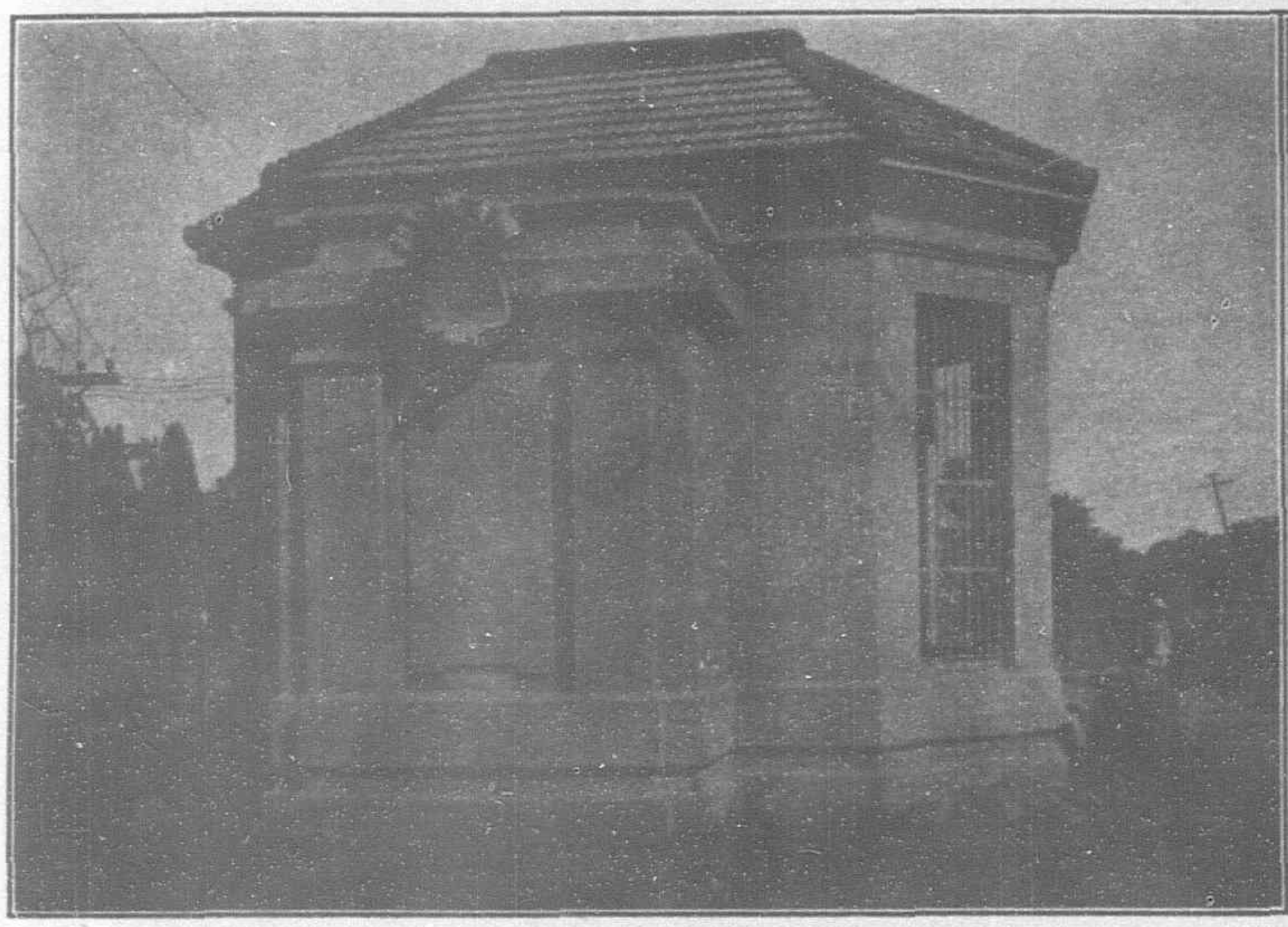
Japan Fire Insurance Co.—At the last general meeting of this company a dividend at the the rate of 15% per annum was directed paid.


MALATE PUMPING STATION
VERT VOLUTE PUMPS
DEPARTMENT SEWER AND WATER WORKS CONSTRUCTION
Scale ½"-1'
July 1908
Discharge
8" Pipe
Suction
Discharge
8" Pipe
Scale ½"=1'
Scale 3"=1'
FOUNDATION PLAN
Con
Drawn by
Traced by A. Alejo

MANILA'S SEWERAGE SYSTEM

By Mr. O. L. INGALLS, C. E.*

The sewerage system of Manila, which is now nearing completion, dates from September 23rd, 1903, when the writer was directed by the Municipal Board to institute an investigation and a study of conditions in Manila with a view to designing such a system as would be best suited to the wants of the city. From that date the writer has been continually employed on the work in question, first in designing and preparing an estimate of cost, next in preparing plans and specifications upon which bids were invited, and lastly engineer in charge of construction


PACO PUMPING STATION

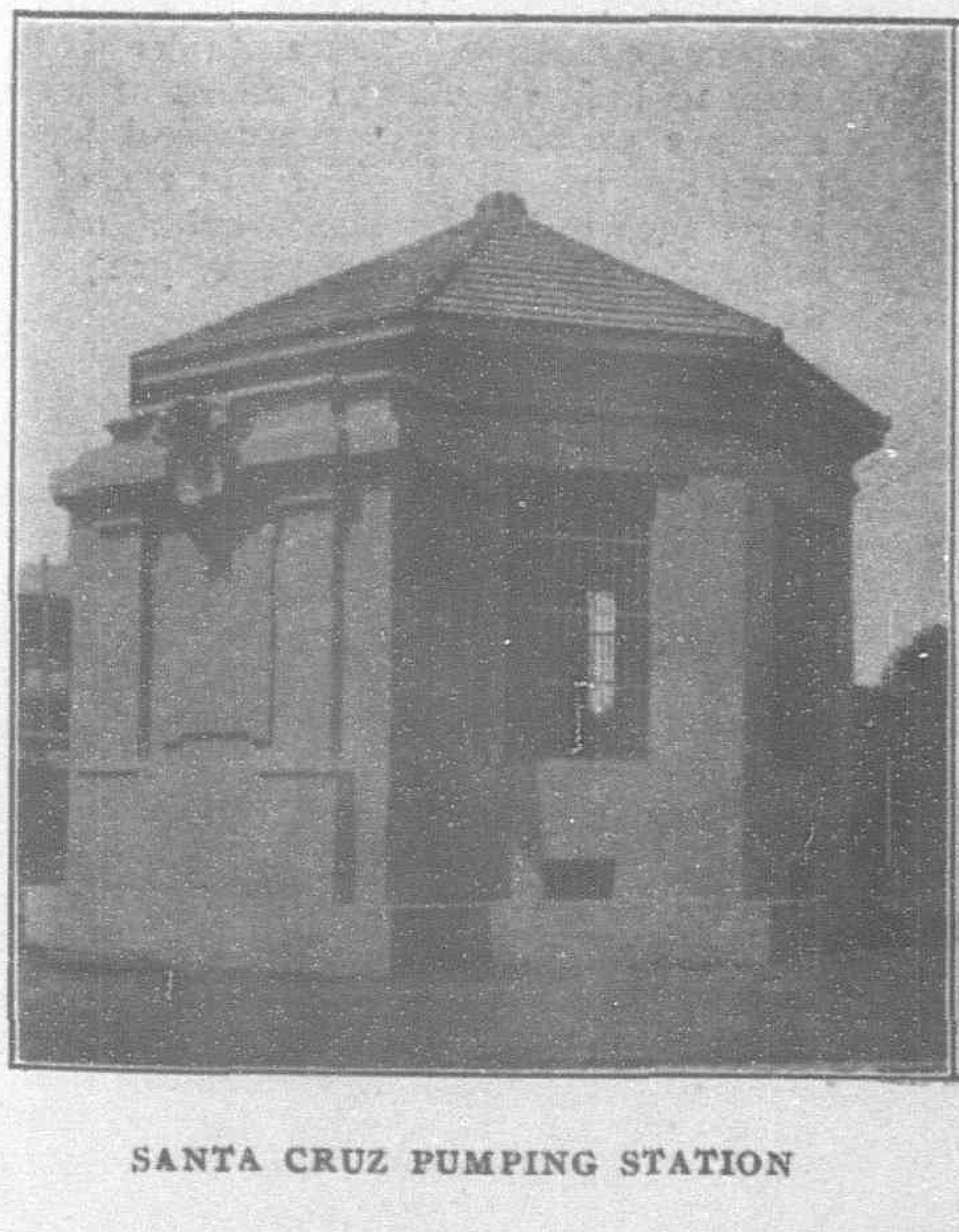
MALATE PUMPING STATION

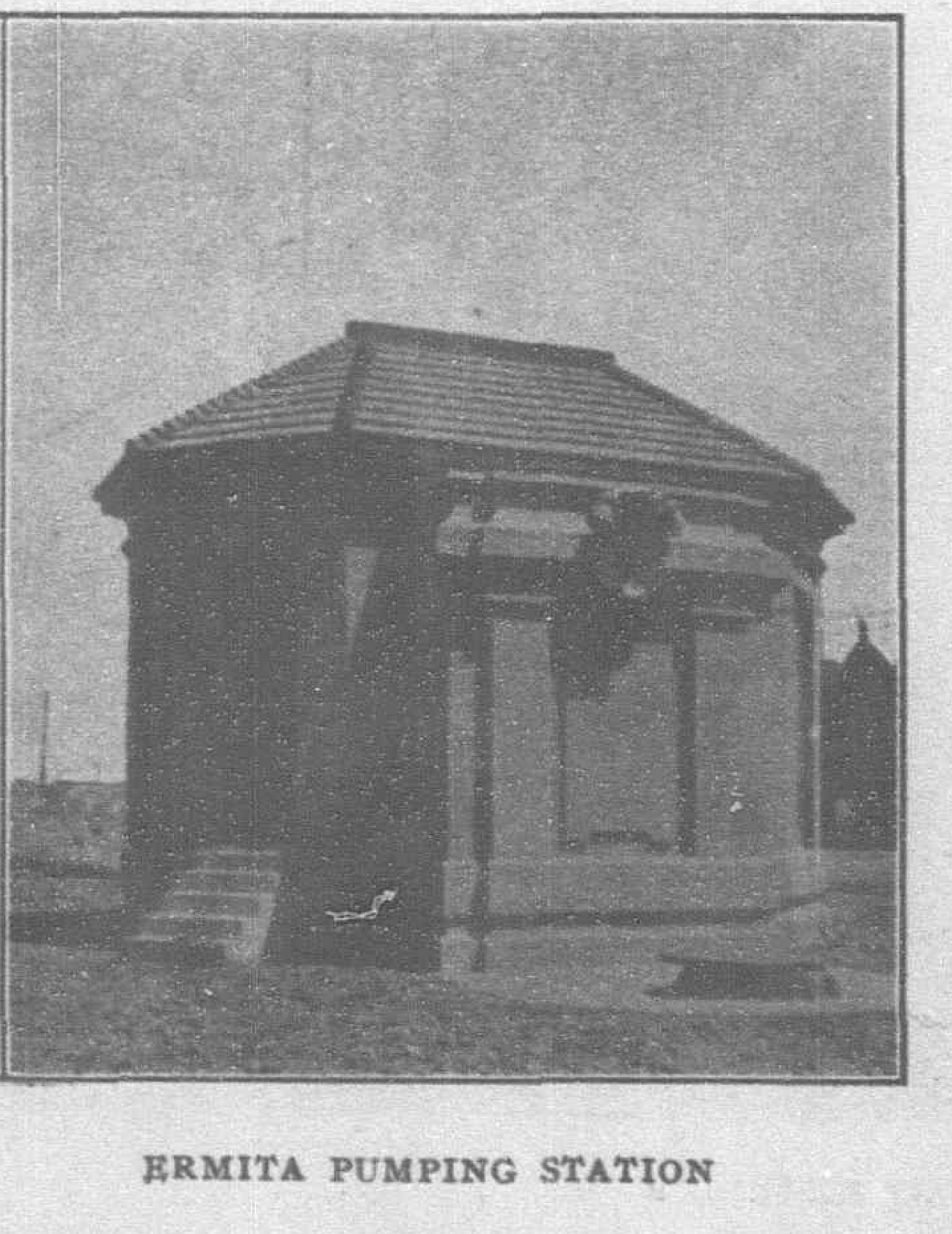
At this time I take pleasure in stating that the system has been installed in its entirety practically as originally planned and at a cost slightly less than was originally estimated.† The sewerage system, which is about to be turned over to the city completed and ready for use, may be of sufficient interest to warrant a brief outline of the work accomplished in its installation and also of the work it is intended to perform.

As is doubtless well known to the citizens of Manila, the sewerage system as designed and built provides for the removal of sewage only, leaving the question of storm water disposal to be considered with the canalization of the esteros.

The sewers range in size from 8 inches to 5.75 feet in diameter and have been laid with slopes sufficient to warrant a velocity of not less than 2.5 feet per second when flowing one-half full, a velocity which will insure the removal of all substances likely to find lodgement inside.

The topographical features of Manila are such that natural conditions for drainage are entirely wanting, and in order to secure the required velocity of flow it was found necessary to create the requisite slopes by beginning the lines of sewer as near the surface of the ground as possible and increasing the depths and sizes as they advanced to a point where it was deemed unwise to go deeper. At these points, therefore, the sewage is raised by means of pumps suitably arranged in pumping stations and again allowed to flow at shallower depths for a considerable distance before again resorting to the necessity of raising the sewage for the same reason. In many of the remote parts of the city the sewage passes through at least three pumping stations before it finally reaches the waters of the bay.


SANTA CRUZ PUMPING STATION


ERMITA PUMPING STATION

The sewers of Manila have been laid at a minimum depth of 5 feet and at a maximum depth of 18 feet to the bottom inside. The minimum depths afford ample clearance to all water mains and storm water sewers and give sufficient depths for a satisfactory service to all abutting property. The maximum depth of 18 feet was believed to be about the limit at which it was practical to construct sewers at a reasonable cost in Manila. All sewers of the city have been laid upon a concrete foundation and great care has been exercised in the jointing of all pipes to insure watertight work. The workmen, although working under the most unfavorable conditions at all times, often standing in mud and water nearly to their knees, yet even under those disadvantages, all sewers have been laid with a perfect alignment and are practically watertight. This condition is most remarkable considering the many unfavorable conditions that prevailed much of the time. I believe I am perfectly safe in stating that there is not a city in the United States having a sewerage system operated under water as it is in Manila, where the infiltration of ground water approaches in insignificance the quantity found in the sewers of this city. The object of excluding all seepage water from the sewerage system is to prevent excessive cost in the operation of the sewer pumps, for all ground water entering the sewers must be pumped one or more times as it is discharged into the bay, and a leak once started can almost never be chalked after the sewers have been put in operation

The sewerage of Manila, as has already been stated, must necessarily have some assistance in its flow from the remote parts of the city to the main pumping station located at the foot of Calle Azcarraga on the North side of the Pasig River and at the same time have a sewer with a greater depth than 18 feet to the bottom inside. This assistance has been afforded by the construction of five so-called lift pumping stations, three of which are located South and two North of the river, besides the main station at which the sewage is collected, elevated approximately 26 feet and discharged into the bay through a 42" cast-iron force main laid ten feet below the bed of the bay, at a point 6,500 feet from shore in line with the outlet to the Pasig River. The other pumping stations have lifts of approximately five feet except the one in Ermita where the lift is about nine feet.

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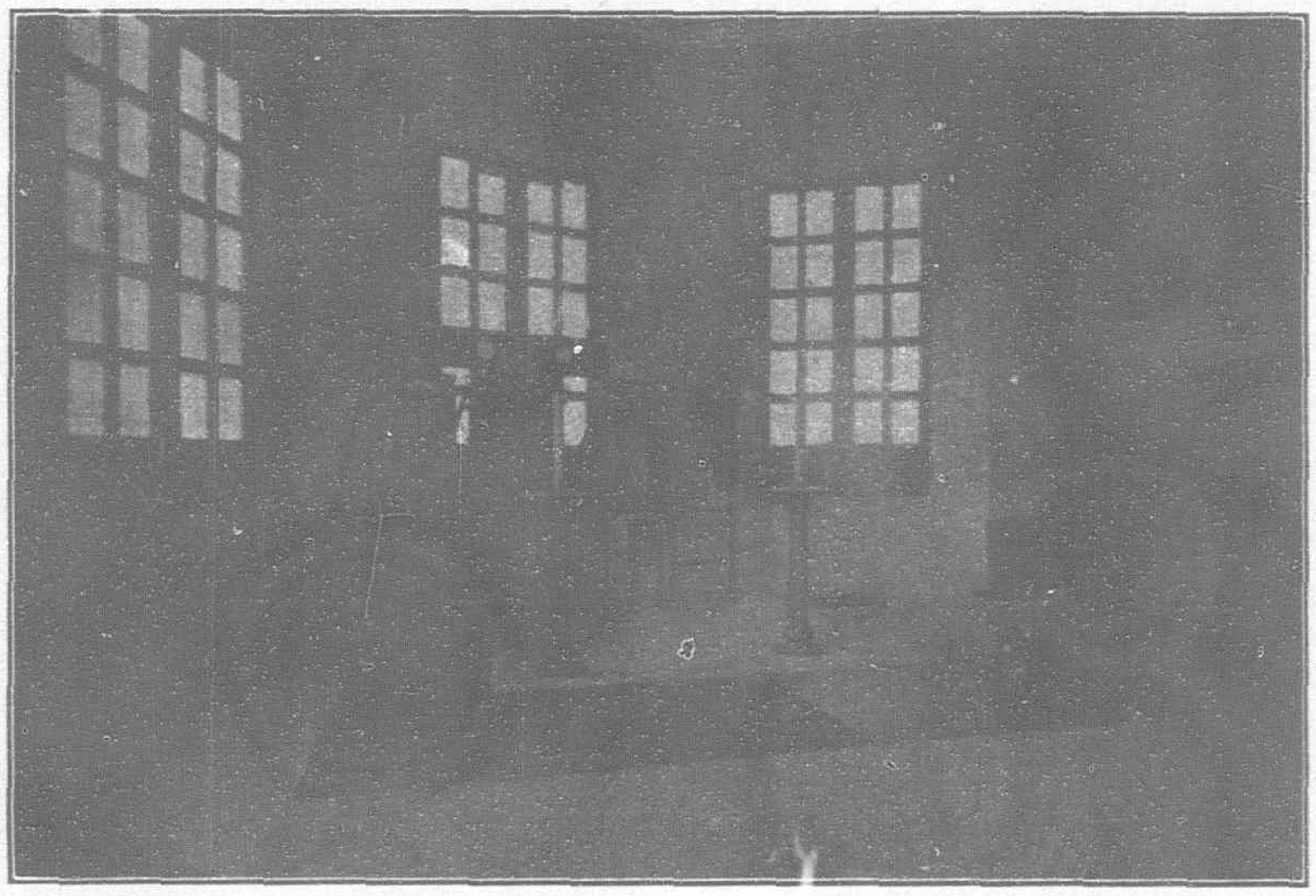
*Chief Engineer in Charge of New Sewerage System of Manila.

†The original estimates placed the total cost at $1,762,327.50 U. S. Currency, while the amount expended does not exceed $1,650,000 U. S. C.


INTERIOR SANTA CRUZ PUMPING STATION

To one unfamiliar with the details of the work, the thought of crossing the Pasig River and the numerous esteros with lines of sewers might at first seem a little hazardous. This has been accomplished no less than twelve times, and in each case with great difficulty but with excellent results. The use of the inverted syphon has been resorted to on several occasions by means of cast-iron pipes in order that a suitable depth might be secured so as not to interfere in any way with navigation. The river crossing, which is about 700 feet long, consists of a double line of 24" cast-iron pipe with alternate flexible and flanged joints. The result has been an unique construction and a well-executed piece of work. The top of this double line of 24" pipe rests at a depth of 24 feet below the surface of the water at low tide and will always have a covering of at least 6 feet below the bed of the river, which is believed to be ample protection from injury of any kind. This pipe was laid from barges in lengths of 12 feet, jointed and bolted by means of divers working at a depth of 24 feet from the surface. This pipe has a greater depth than any other part of the sewerage system and is subjected to considerable water pressure, yet the leakage amounts to almost nothing.

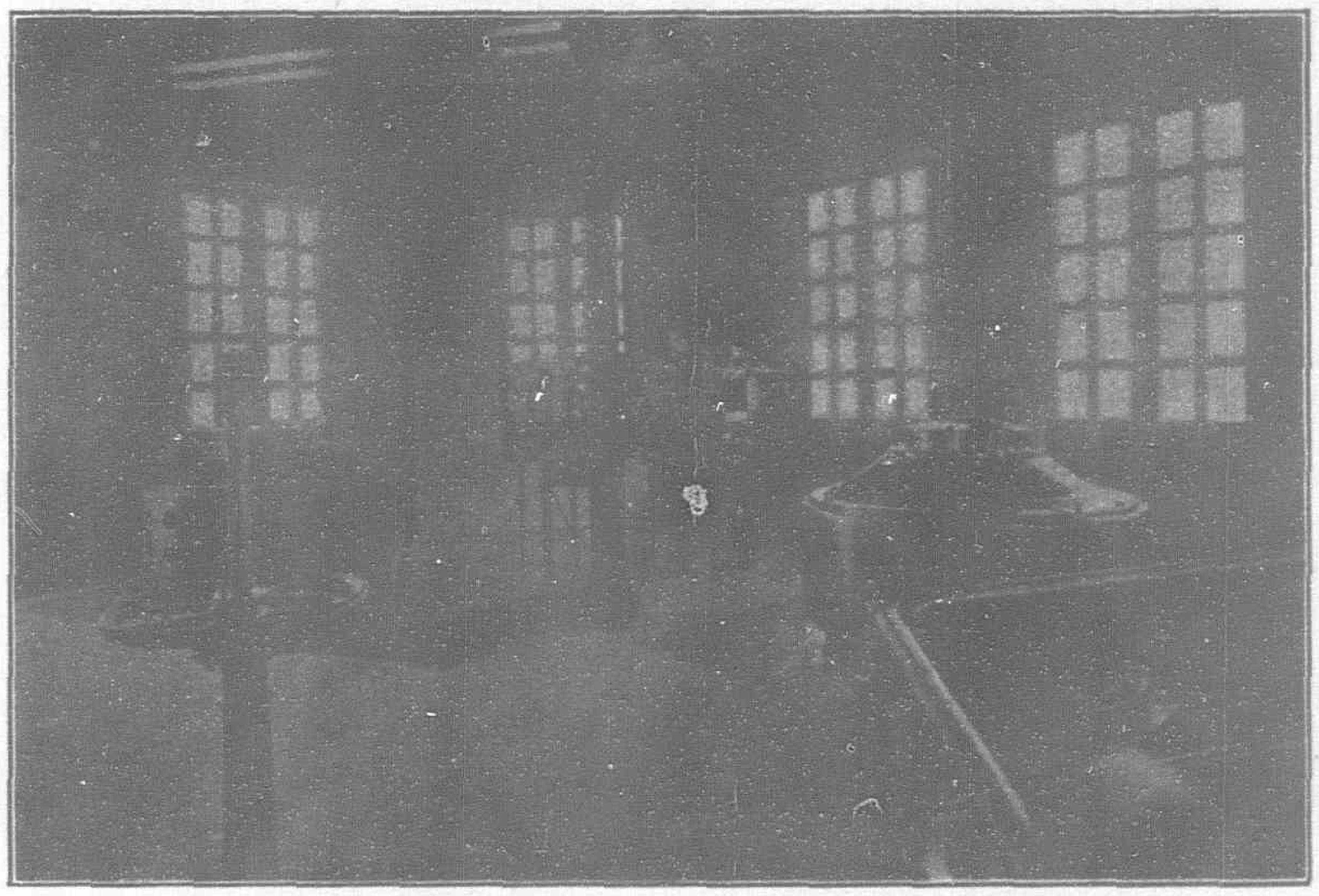
The 42" cast-iron outfall pipe was laid in a dredged channel upon a pile and cap foundation. The piles were driven in bents of two each at 9 foot intervals while at the outlet end the pipe makes a quarter turn and terminates in a vertical position. This arrangement was made necessary in order that the discharge would take place above the bottom of the bay. This outlet end is encased in a huge block of cement masonry which in turn rests upon the timber platform supported by a group of piles.

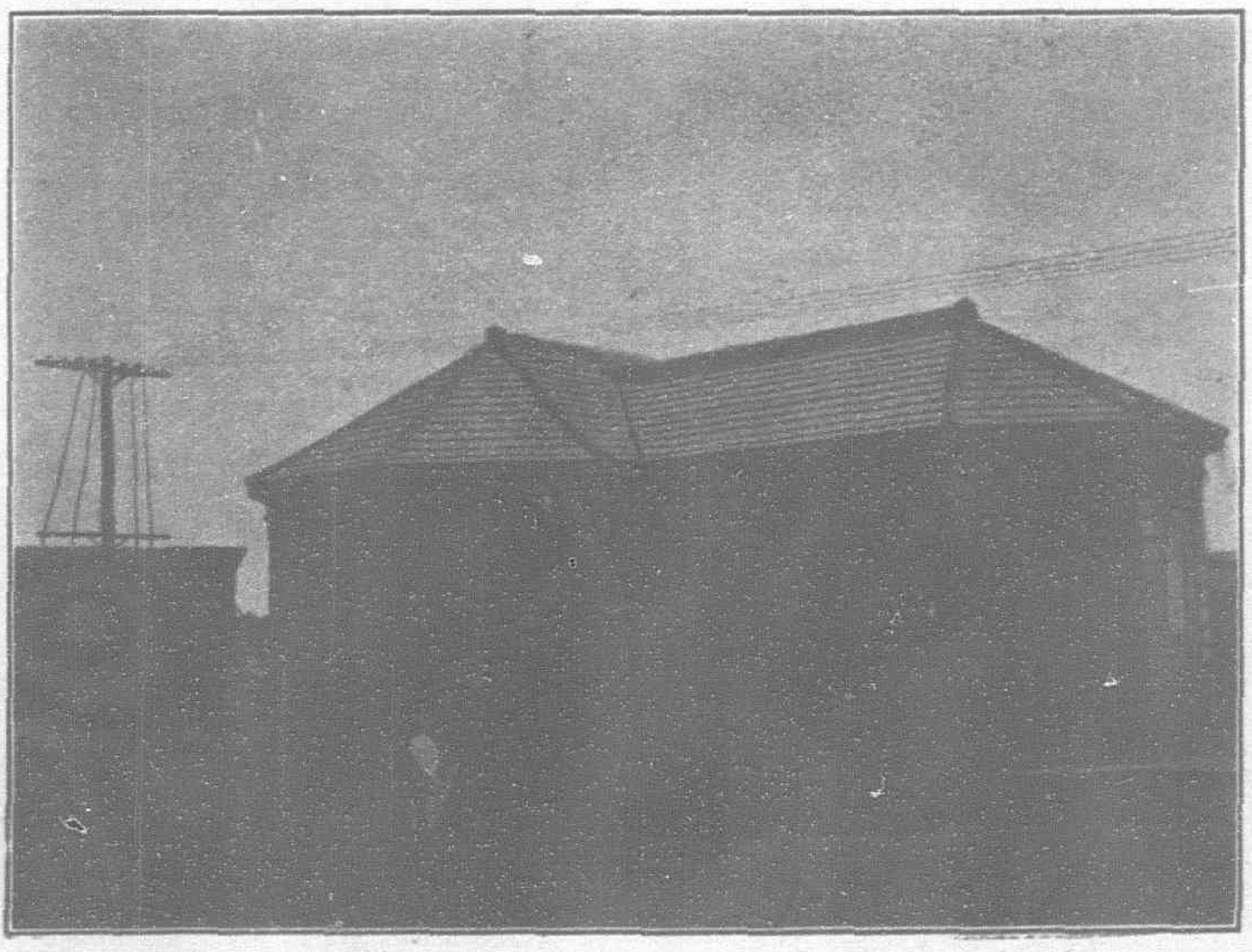
Provision has been made for the introduction of house connections in all the lines of sewer, generally at intervals of about 40 feet. These branches have been provided with standpipe on all deep lines of sewer so that the maximum depth of excavation for each connection will be less than six feet. These terminals were carefully located while exposed in the trench and can be reproduced wherever desired for use.

Manholes have been built at intervals of about 300 feet along the sewers for the purpose of making proper inspections, cleaning, if necessary, and the removal of obstructions if such occur. These manholes are provided with tight covers to prevent the introduction of mud and storm water and the possible escape of objectionable odors.

The sewers will be satisfactorily ventilated by omitting the vent trap and continuing the soil pipe and vent stack of each house connection full size through and above the roof. This arrangement will necessitate care in inspection to see that pipe joints in houses are made air-tight and that all fixtures are carefully trapped and properly ventilated

Flush tanks with suitable connections to the water system supply have been constructed at the ends of the primary lateral sewers for the purpose of keeping them clean and in satisfactory condition These tanks have been built to hold about 350 gallons of water each and are provided with gates and handles for operation by hand. The system of flushing introduced in Manila is somewhat unique and, so far as I am aware, has never been tried elsewhere.


MAIN PUMPING STATION, INTERIOR

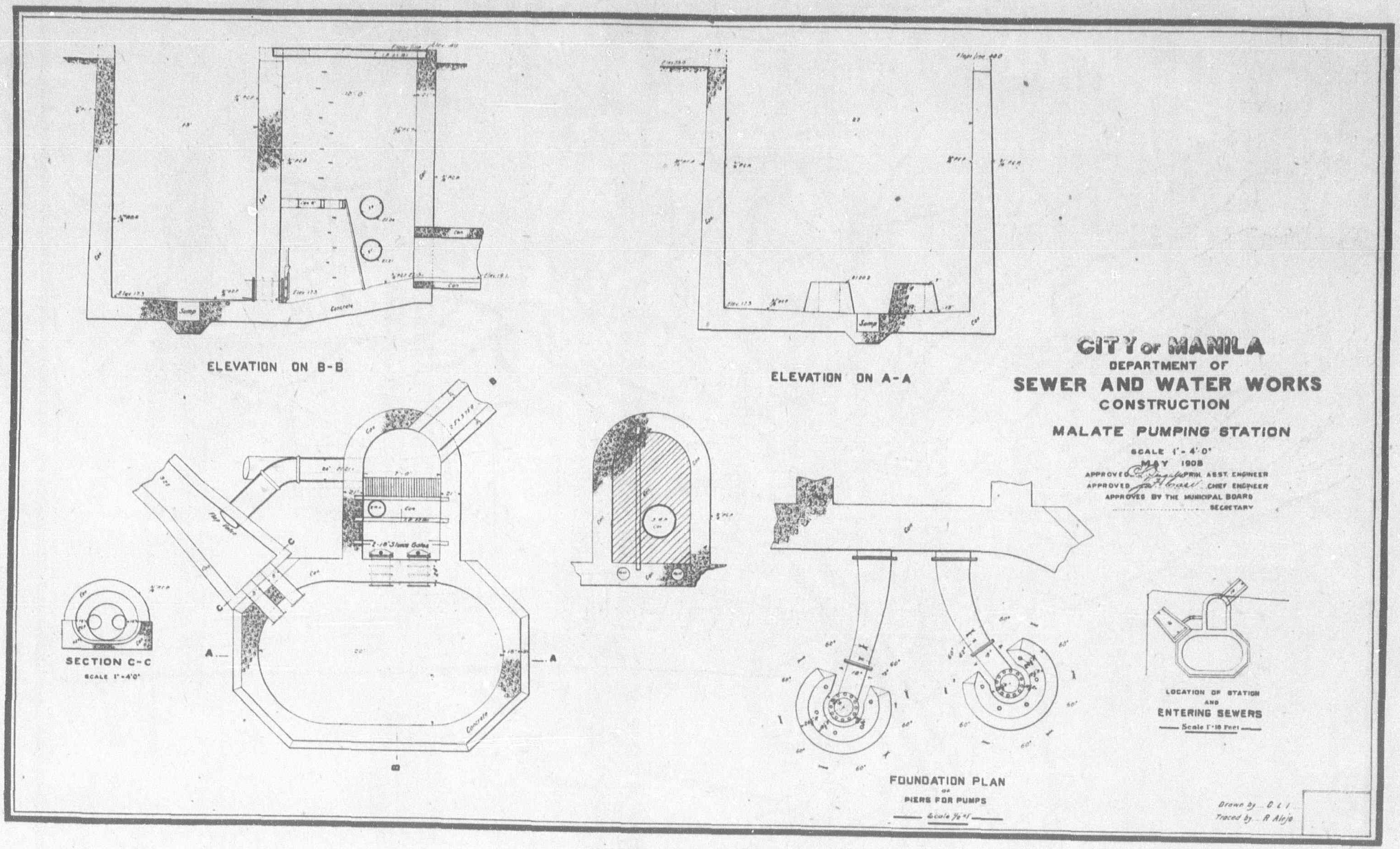

MAIN PUMPING STATION, EXTERIOR

Excellent results will unquestionably be obtained by this method of flushing and at the same time less water will be consumed in the operation and at less cost than by any other method.

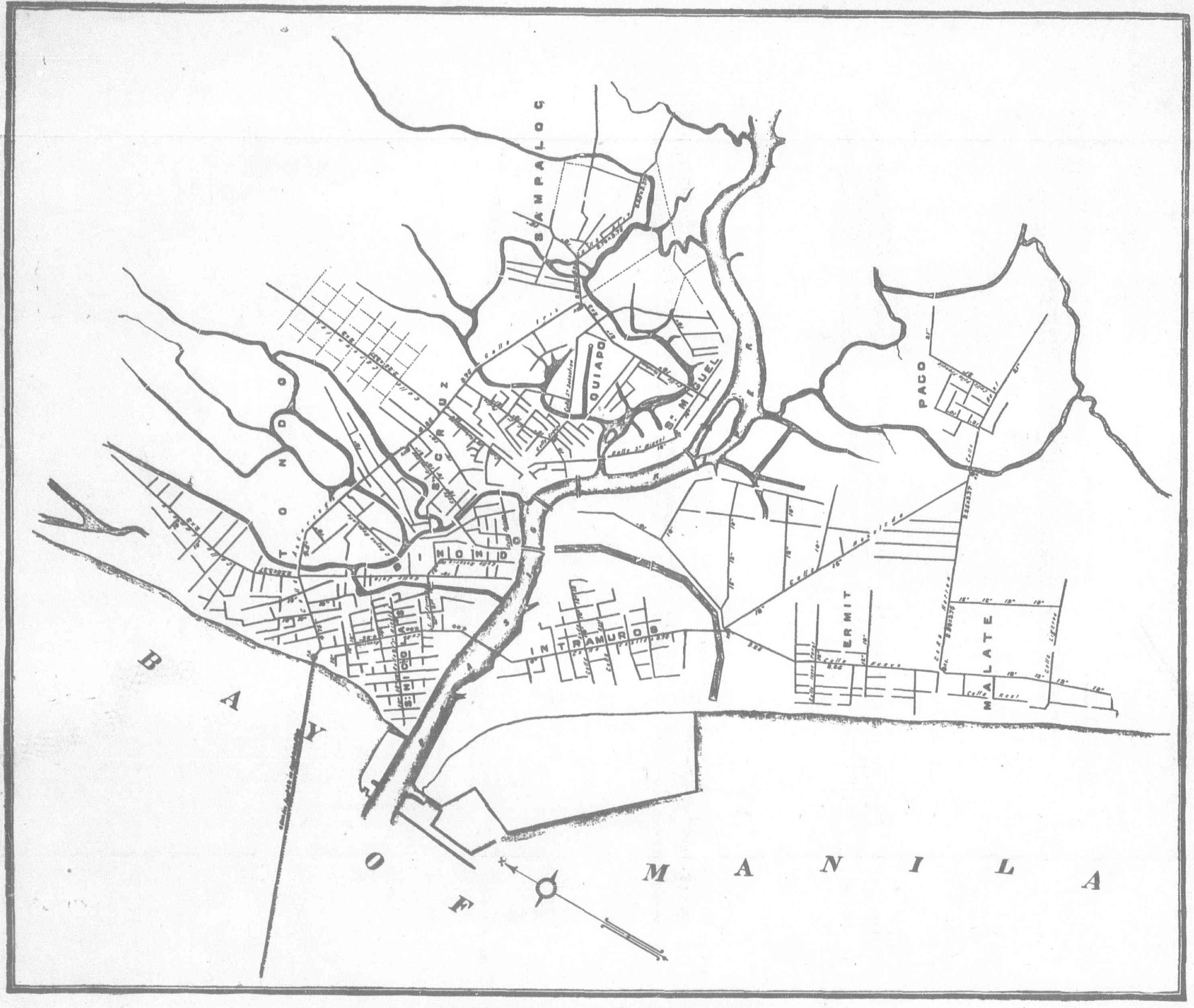
The class of machinery and the kind of power available for operating the six pumping stations was a question that required much study and resulted in the selection of centrifugal pumps electrically driven by power to be furnished by the Manila Electric Street Railway and Light Company.

All stations have been provided with pumps and motors in duplicate to guard against delays in operation due to possible accidents to the machinery.

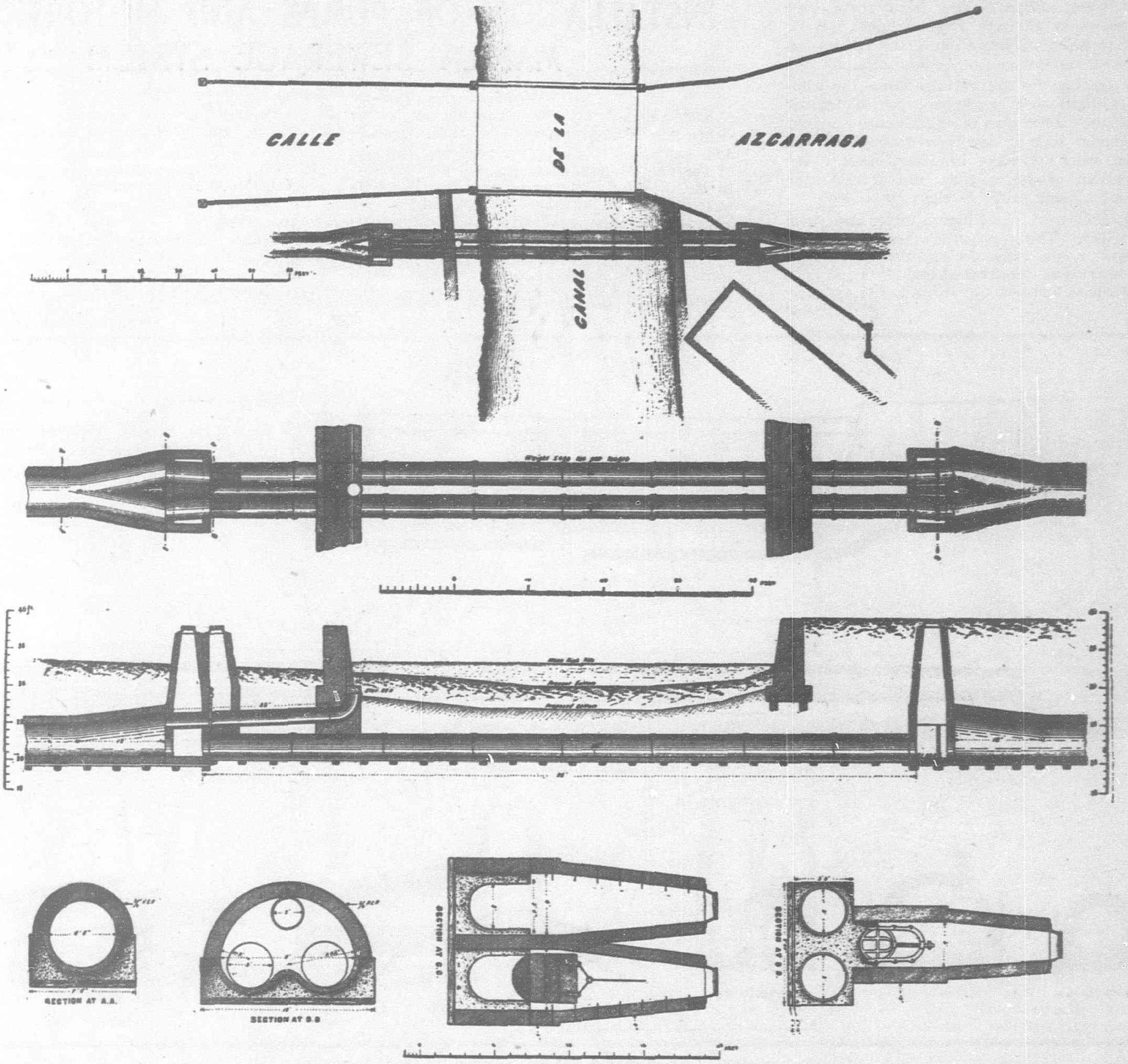
The arrangement of the pumps and motors in all stations is similar except that in the main station the pumps and motors are directly



MALATE PUMPING STATION



GENERAL PLAN OF MANILA'S SEWERAGE SYSTEM



CROSSING OF ESTERO DE LA REINA REGENTE AT CALLE AZCARRAGA

connected by means of a vertical shaft while in the smaller stations, for the sake of economy, the pumps are connected to the motor by means of a vertical shaft and gear. All pumps are located below the surface in dry pits easy of access and always ready for use without priming.

All pumping stations are so arranged that in case of interruption to the machinery from one or any cause, the sewage after rising a short distance inside the sewers will be by-passed and continue moving to the next station and pass out as though nothing had happened And if for any cause all the pumps should be out of operation for a day or two, provision has been made to allow the sewage to rise in the sewers to the elevation of the water in the bay when it will be discharged by gravity through overflows provided, thereby causing no inconvenience or particular concern to any of the inhabitants of the city.

In concluding this article, I wish to state that the city of Manila has been provided with a sewerage system designed with mathematical accuracy, capable of extension far beyond the present limits and of sufficient capacity to accommodate a city of 500,000 people and yet capable of perfect operation even while serving a population forming a small part of that number. The cost of operation will always be in direct proportion to the amount of sewage contributed.

The completion of this system is of vast importance to the health of the community and it is to be hoped that the inhabitants of the city will not delay in availing themselves of a blessing that cannot be over estimated.

THE INSTALLATION OF MANILA'S NEW SEWERAGE SYSTEM

The completion of the excavation work and the installation of the Manila sewer system on May 25th, when it was turned over by the contractors, the Atlantic, Gulf and Pacific Co., just five weeks in advance of contract time, gave to the capital of the Philippines one of the most modern and effective systems in operation in any city of its size in the world.

Bids were advertised for on August 1st, 1905, for the excavation work, supplying and laying the pipe, etc., and the bids were opened on January 12th, 1906. The contract was awarded the Atlantic, Gulf and Pacific Company and the price was approximately ₱3,000,000. The contract called for the completion of the work involved on July 1st, 1909. The first sewer was laid in July, 1906.

Some idea of the magnitude of the contract may be gathered from the fact that the excavation alone represented 340,000 cubic yards and the iron pipe used weighed 2,400 tons and made 8,500 lineal feet. Of this there were 6,260 lineal feet of 42" pipe used for the outfall and sewer in the bay and the balance of from 8" to 24". The concrete used in this construction was represented by 40,000 cubic yards and in this work over 50,000 barrels of Green Island Cement was utilized. All the main sewer was constructed of concrete as were over 900 manholes and 265 flush tanks for flushing the entire system. The length of the main sewers is approximately eight miles built in egg shape as indicated in illustration.

Over 2,000 cubic yards of brick masonry were laid in the manholds in which over 1,200,000 bricks were utilized. The terra cotta pipe laid covers in all over 225,000 lineal feet or about 40 miles varying from 8″ to 24″ in diameter

For bracing the excavations alone, the company utilized over 1,000,000 feet of lumber which gives some idea of the extensive operations under way at one time throughout the city in order to make headway, meet every requirement of the contract and at the same time not impede traffic in the city streets.

The labor used was Filipino under American supervision. The average number on the payroll was 2,250 daily during the operations. The supervising force comprised of from 20 to 40 American foremen according to the arrangement of the operations and the progress of the work towards completion. While there were usually double the number of laborers on the payroll than represented the number actually working every day, not a few reported for work every day during the three years.

Great credit is due Mr. F. E. Foster, Superintendent for the Atlantic, Gulf and Pacific Company, for his able direction of the operations which was responsible for the very satisfactory installation and that it was also completed in record time.

As one engineer of prominence stated in regard to the character of this installation "I firmly believe that the sewer system, as completed, is today tighter than any laid in the word of equal size."

The Atlantic, Gulf & Pacific Company also constructed the different pumping stations which came under separate contract. The price was $71,500 U. S. Currency.

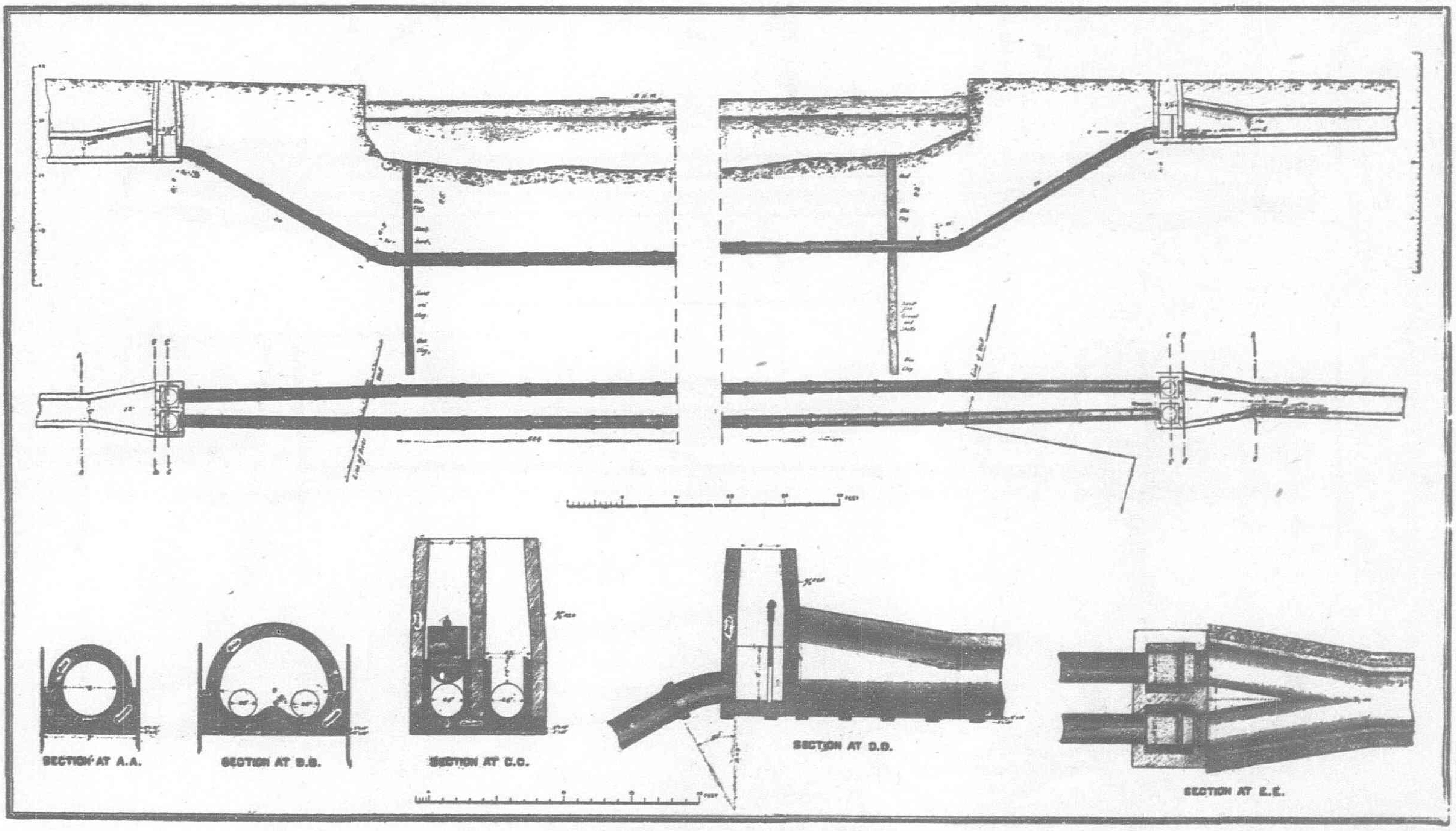
PHILIPPINE GOLD OUTPUT FOR MAY

The Paracale Gold Dredging Company, 572 ounces.

The Benguet Consolidated, 218 ounces bullion and 78 pounds cyanide.

INSTALLATION OF PUMPS AND MOTORS FOR MANILA SEWERAGE SYSTEM

The contract for the supplying of twelve electrically driven pumps and twelve motors and installing them in six pumping stations of the new Manila sewer system was awarded to Mr. Frank L. Strong of Manila. The bids were opened on January 15th and the contract awarded January 30th, after a close competition. The price was $53,600.00. In awarding the bid Major Case, who has charge of the work, recommended to the municipal board that the bid of Mr. Strong—the only one under the highest bid that complied with the specification as to date of completion—be accepted.



CROSSING UNDER PASIG RIVER HEAD OF CALLE NUMANCIA

The electric current supplied for operating the motors is as follows: Alternating current; 220 volts; 2-phase 4-wire 60 cycles.

Station.	Lift.	Gallons per twenty-four hours.	Pumps. Number.	Pumps. Size.	Motors. Number.	Motors. Horsepower.
	Feet.	*Each.*		*Inches.*		
Main........	25	25,000,000	2	24	2	150
Ermita......	10	5,000,000	2	12	2	15
Santa Cruz..	5	12,000,000	2	18	2	15
Quiapo......	5	5,000,000	2	12	2	10
Malate......	5	2,400,000	2	8	2	7½
Paco........	5	800,000	2	5	2	5

The main station receives the sewage from the sub-stations, and with a lift of 25 feet it flows out into the harbor through a pipe 6,000 feet long.

As each of the two pumps at the main station has a capacity of 25,000,000 gallons daily, which is far in excess of present requirements, Manila is assured of adequate sewage disposition for many years to come.

The bids submitted follow:

The Atlantic, Gulf & Pacific Co., $66,850.00, Westinghouse Motors and Bryan Jackson Pumps.

Frank L. Strong, $53,600.00, General Electric Motors and Henry R. Worthington, New York, Pumps.

Findlay & Co., $49,250.00, Westinghouse Motors and Worthington Pumping Eng. Co., London, Eng.

Germann & Co., $46,995.00, General Electric Motors and Morris Pumps.

De Oilier Engineering Co., $35,780.00, their own goods.

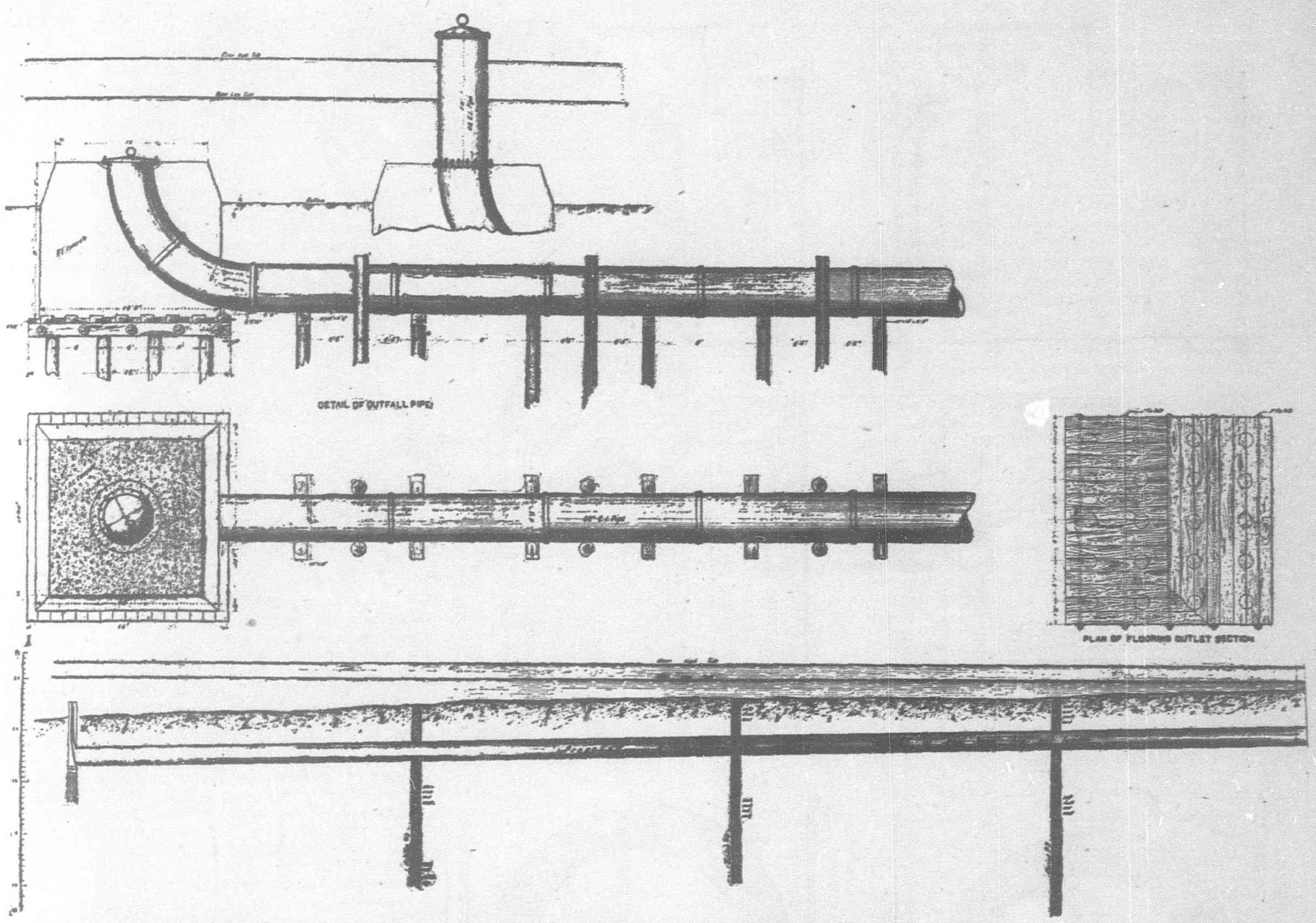
Frank L. Strong, the successful bidder, is one of the oldest American engineering contractors in the Philippines and representative of the General Electric Co. of Schenectady, New York, and associated with him is Stuart S. Harvey, special eastern representative of Henry R. Worthington, New York, the famous pump manufacturer, and who has been active in the Philippines for the last eight years.

While the specifications called for two motors for the main station of 150 h. p. each Mr. Strong's bid provided for two motors of 155 h. p. and these latter were installed.

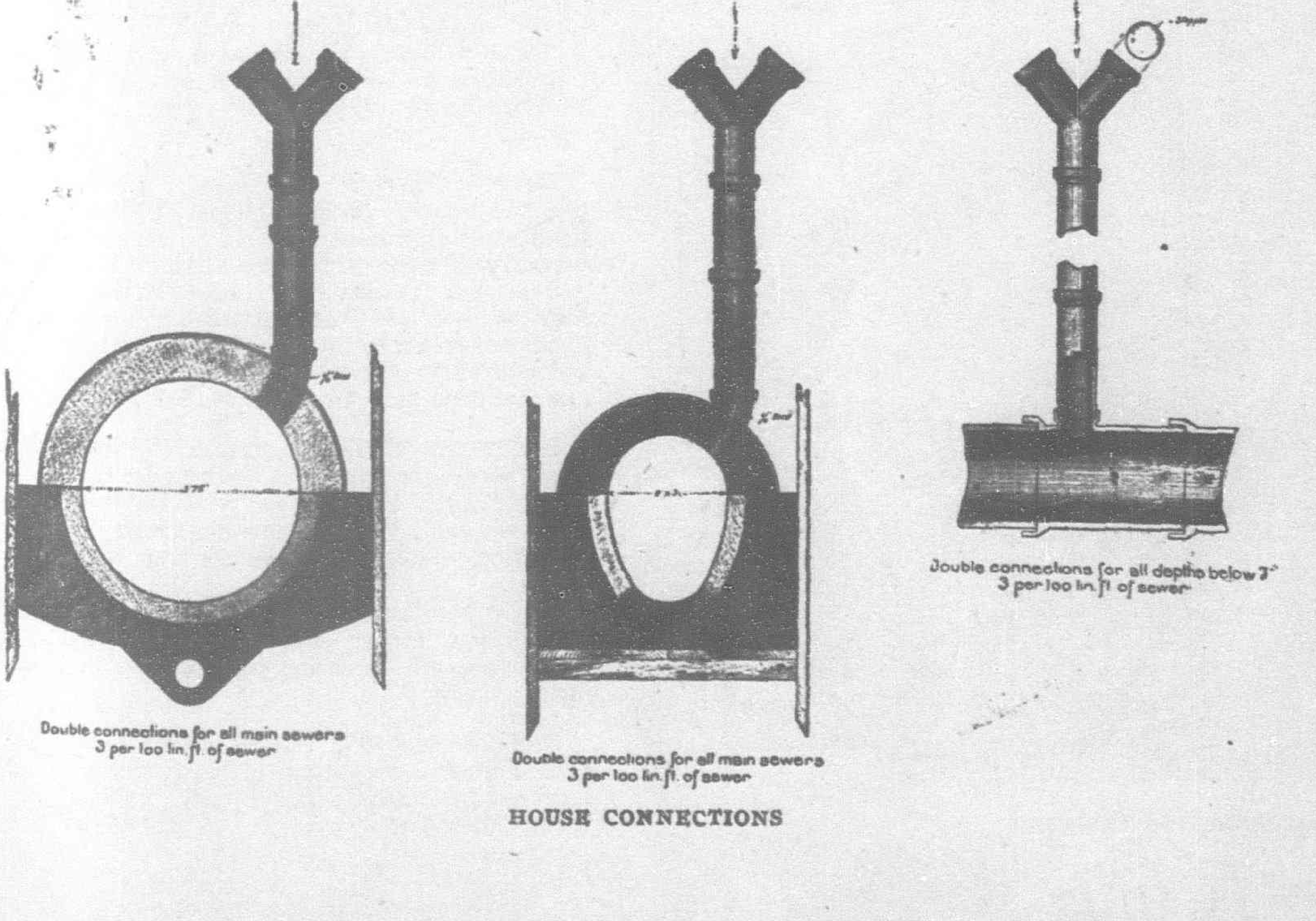
SPECIAL FEATURES OF THE INSTALLATION.—In the substations of Paco, Malate, Ermita, Quiapo, and Santa Cruz each motor is supplied with an automatic switch for starting and stopping it. This switch is actuated by a float which rises and falls with the sewage, automatically, giving current to the motor when the screen chamber fills above a given point, and falling as the chamber is emptied stops the motor when the desired level is reached.

The 155 horse power motors at the main station run at the same speed as the pumps, and are connected directly to the pump shafts. As the smaller motors of the substations run at a much higher speed than their pumps, the reduced pump speeds are obtained by installing gears and pinions between motor and pump. The accompanying illustration shows these gearing arrangements.

The City of Manila may be congratulated on having their sewage system operated by



OUTFALL PIPE LEADING INTO MANILA BAY



Double connections for all main sewers 3 per 100 lin. ft. of sewer

Double connections for all main sewers 3 per 100 lin. ft. of sewer

Double connections for all depths below 7' 3 per 100 lin. ft. of sewer

HOUSE CONNECTIONS

machinery of the latest approved type, and exactly similar to that installed in leading cities of the United States. One of the most notable of these installations is that in the City of New Orleans, and on a very much larger scale. Buffalo, N. Y., and that of the St. Louis World's Fair are among other installations of the same type in recent years.

The names of the manufacturers of the various parts on the outfits are a sufficient guarantee of their high grade and excellence, and are as follows:

MOTORS AND SWITCHBOARDS.—General Electric Co., Schenectady, N. Y.

PUMPS.—Henry R. Worthington, New York City.

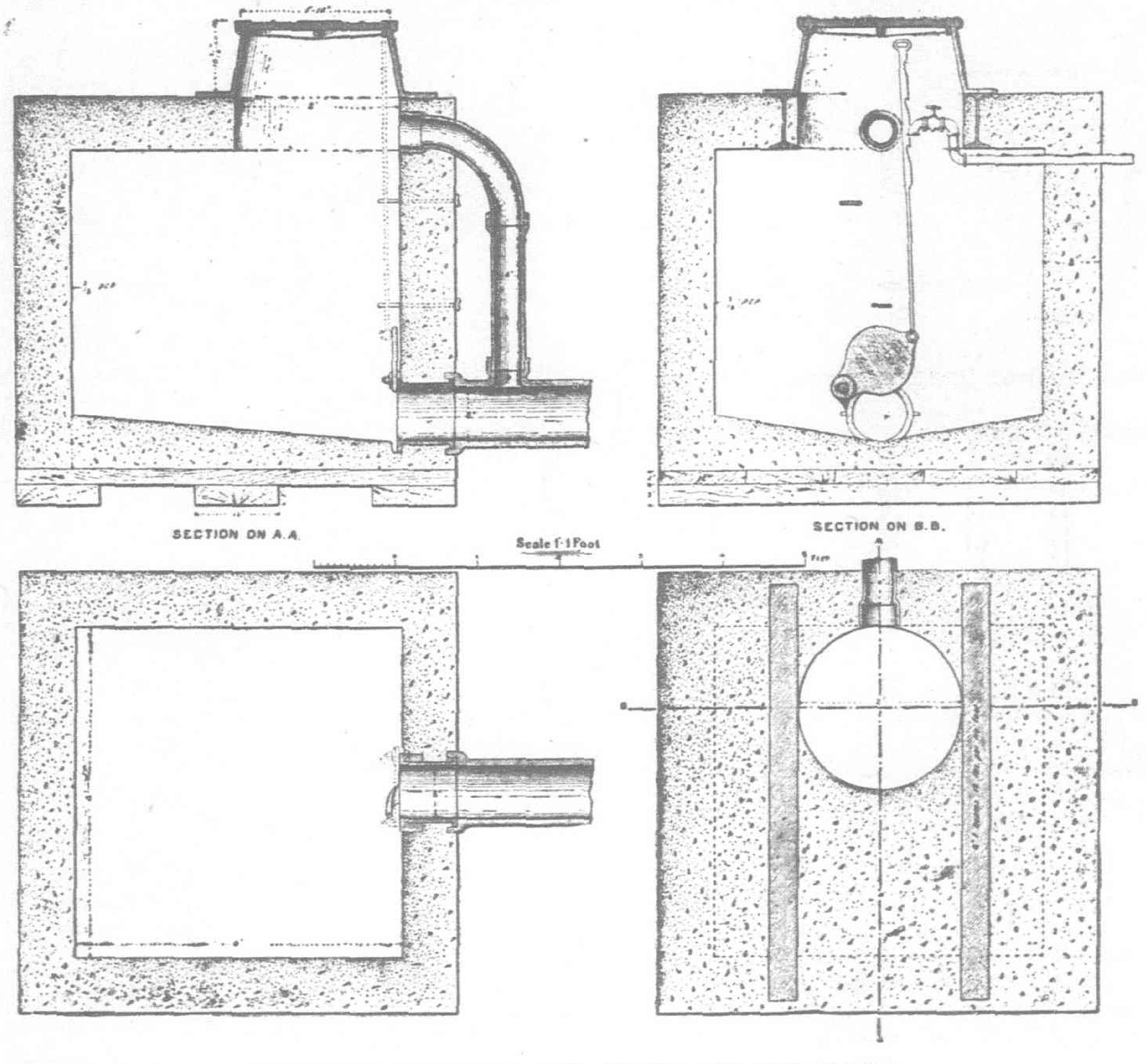
GEARING AND CONNECTIONS.—A. & F. Brown Co., Elizabethport, N. J.

VALVES.—Ludlow Valve Mfg. Co., Troy, N. Y.

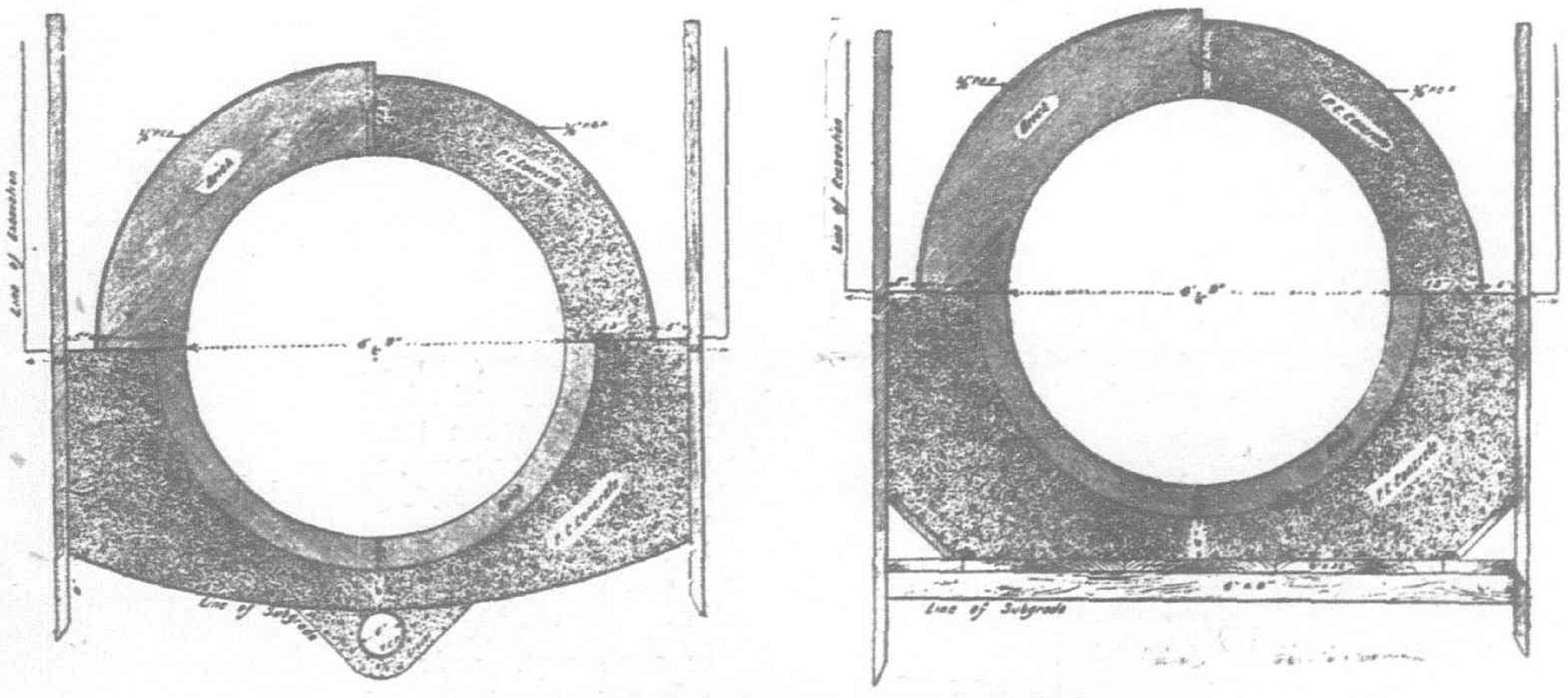
PIPE AND FITTINGS.—John Simmons Co., New York City.

It is of interest to note that the pipe and valves are of large size, especially at the Main station, where a single valve weighs more than four tons.

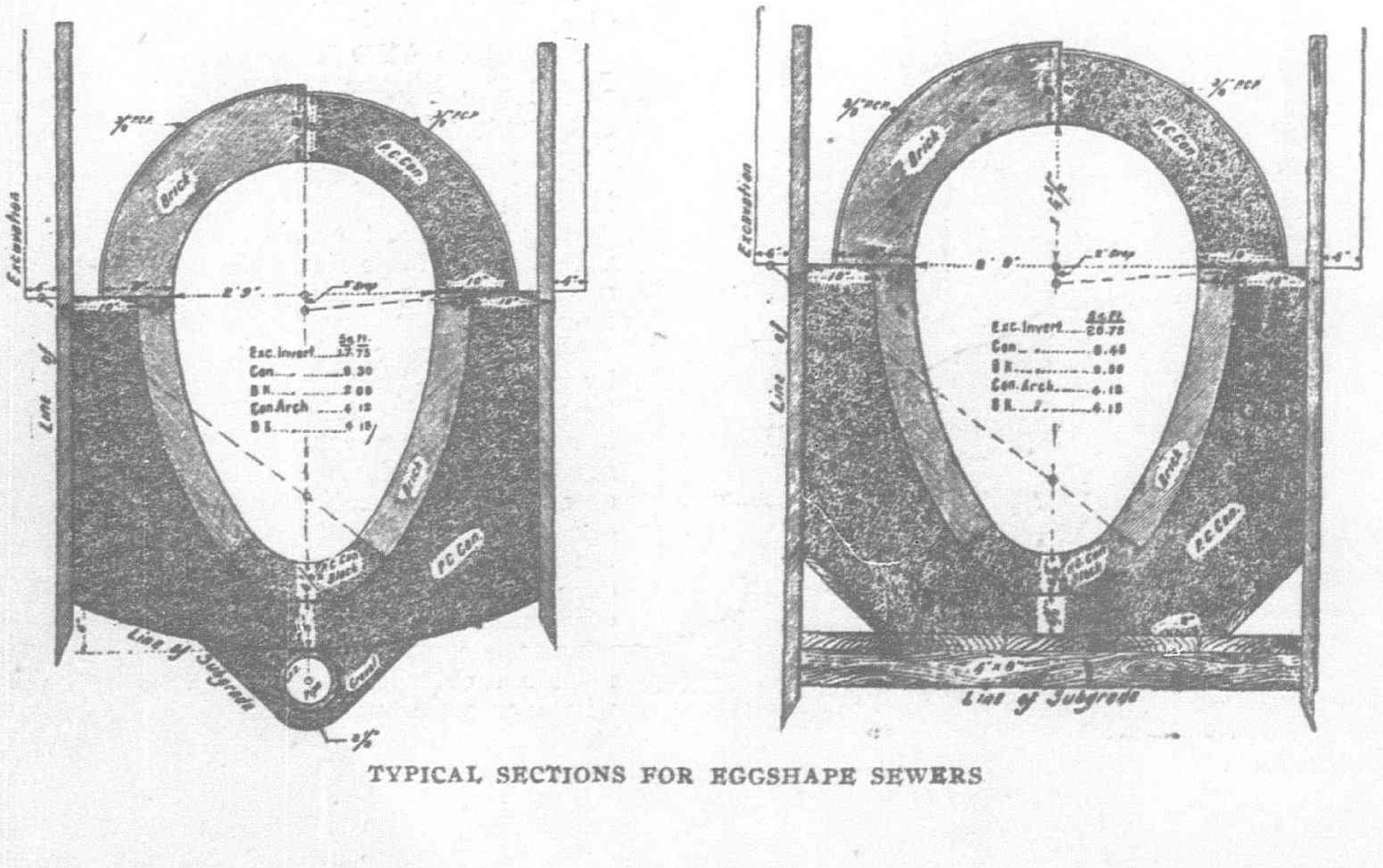
Various unexpected delays were experienced by the city in obtaining title to certain locations for the plants, involving legal processes, making it impossible to prepare the buildings and the machinery foundations for the contractor at as early date as anticipated. As soon as any one station was ready for the installation of the machinery, the work of placing it was at once commenced and diligently prosecuted to completion. The care and understanding with which the contract was drawn by the Engineer in Chief is evidenced by the fact that no changes whatever were made during the installation, and not one dollar of extras was charged the City.



TERMINAL MANHOLE AND FLUSH TANK COMBINED



TYPICAL SECTIONS FOR MAIN SEWERS



TYPICAL SECTIONS FOR EGGSHAPE SEWERS

VERTICAL CENTRIFUGAL PUMPS SUPPLIED BY HENRY R. WORTHINGTON CO., NEW YORK, MAIN STATION.—Total lift including suction, static head, and frictional head, 25′ (feet), capacity of each pump twenty-five million (25,000,000) gallons per twenty-four hours. For handling these conditions two twenty-four inch Worthington Pumps of the vertical shaft volute type, having a single bottom suction opening and enclosed impeller, were selected. These pumps are arranged with a pair of couplings at the top center for connecting to vertical shaft running direct to the rotator of motor. The size of the pump shaft is 4½″ diam. and each pump weighs approximately 17,000 lbs.

ELECTRICAL EQUIPMENT FOR OPERATING CENTRIFUGAL PUMPS FOR THE MANILA SEWER SYSTEM, MAIN STATION.—The installation in this station consists of 2-Type IQ-20 pole, 155 H.P., 350 R.P.M., 220 V. two-phase 60 cycle alternating current vertical type induction motors arranged for direct connection to 24-inch vertical centrifugal pumps, each motor being complete with starting compensator. For controlling the motors, 2-induction motor starting panels are installed and for controlling the incoming power 1-600 amp. lever switch is included.

The station is equipped with a ten ton Triplex Block manufactured by Messrs. Yale & Town Mfg. Co. for lifting motors and pumps.

SANTA CRUZ STATION, PUMPS.—The total head in this instance, including suction lift, station head, and frictional head, is five feet and the capacity of each of the two pumps installed is twelve million gallons per 24 hours. The pumps are 18-inch volute and of the vertical and bottom suction type. The weight of each pump is 11,000 pounds.

SANTA CRUZ STATION, ELECTRICAL EQUIPMENT.—This station is equipped with 2-Type IQ, 10 pole, 17 H.P., 720 R.P.M., 220 V. Form "K" two-phase 60 cycle vertical type alternating current induction motors arranged for gearing.

For controlling the above motors there are 2-induction motor starting panels and for controlling the incoming current, 1-60 amp. lever switch.

QUIAPO STATION, PUMPS.—In this station the specifications called for a five foot lift, including suction lift, static head, frictional head, and the capacity of each pump is five million gallons per 24 hours. Two 12-inch pumps driven by 10 H.P. motors with a pump speed of 200 R.P.M. have been installed.

QUIAPO STATION, ELECTRICAL EQUIPMENT.—This station is equipped with 2-Type IQ, 8 pole, 10 H.P., 900 R.P.M., 220 V. Form "K" two-phase 60 cycle vertical type alternating current induction motors arranged for gearing to 12″ vertical centrifugal pumps.

For controlling the above motors there are 2-induction motor starting panels and for controlling the incoming current, 1-30 amp. lever switch.

ERMITA STATION, PUMPS.—In this station the total head including suction lift, static head, and frictional head is 10 feet, and the capacity of each pump five million (5,000,000) gallons per twenty-four hours. Two twelve inch pumps are installed with fifteen brake horse power each, and are of the vertical and bottom suction type. The speed required is one hundred and fifty R.P.M. full load.

ERMITA STATION, ELECTRICAL EQUIPMENT.—This station contains 2-Type 1-Q, 10 pole, 15 H. P., 720 R.P.M., 220 V. Form "K" two phase 60 cycle vertical type alternating current induction motors arranged for gearing to the pumps.

For controlling the above motors there are 2-induction motor starting panels and for controlling the incoming current, one 60 amp. lever switch.

MALATE STATION, PUMPS.—Each pump installed has a capacity of two million four hundred thousand (2,400,000) gallons per twenty-four hours, and are described as two

MR. FRANK L. STRONG, M. E.

8-inch vertical volute pumps each weighing about 2900 lbs. Each pump runs at a speed of 260 R.P.M.

Malate Station, Electrical Equipment.—This station contains 2-type 1Q, 8 pole, $7\frac{1}{2}$ H.P. 900 R.P.M., 220 V. two-phase 60 cycle vertical type alternating current induction motors arranged for gearing.

For controlling the above motors there are installed 2-induction motor starting panels and for controlling the incoming power one 30 amp. lever switch.

Paco Station, Pumps.—Two five inch pumps with a capacity for each pump of eight hundred thousand (800,000) gallons per twenty-four hours and of vertical volute type are installed here. These pumps are furnished with thrust bearings and coupling at the top of pump and with suction and discharge flanges drilled. Each pump weighs about 1700 lbs. and the full load speed is 385 R.P.M.

Paco Station, Electrical Equipment.—This station contains 2-type 1Q, 8 pole, $5\frac{1}{2}$ H.P. 900 R.P.M., 220 V. Form "K" two phase 60 cycle vertical type alternating current induction arranged for gearing to pumps.

For controlling the above motors there were furnished 2-induction motor controlling panels and for controlling the incoming line one 30 amp. lever switch.

General Description of the Worthington Vertical Volute Centrifugal Pump for Manila Sewerage System.—The pumps are of the vertical shaft volute type having a single bottom suction and enclosed impeller.

Casing.—The main casing is of strong close grained cast iron volute in form and of proper thickness to withstand all stresses incident to normal service. The side plates consist of removable covers of cast iron making a male and female fit with the casing and fastened thereto by means of suitable bolts. The general design is such as to facilitate the removal of the internal parts for examination and repairs.

Impeller.—The impeller is constructed of cast iron and of the enclosed type having single bottom suction with balancing chamber, thereby reducing the end thrust to a minimum. It is cast in one piece and machined and polished on the outside. The cored water passages are filed and chipped smooth thus insuring a high efficiency. The impeller is in perfect rotative balance mounted on a shaft with all moving parts.

Shafting.—The shaft is of machine steel accurately machined and polished. It operates in babbitted bearings. Where necessary the stuffing boxes are provided with water seals consisting of a lantern gland in the box connected by means of suitable piping with the pressure water on the discharge side of the pump. This method of sealing effectually prevents suction air leaks and is essential to the successful operation of the pump where excessive suction lifts are encountered. The shaft is a close fit in the impeller hubs and is provided with a shoulder against which the impellers are held by means of a nut on the suction side.

Thrust Bearing.—A suitable thrust bearing is provided to support the weight of the revolving pump parts.

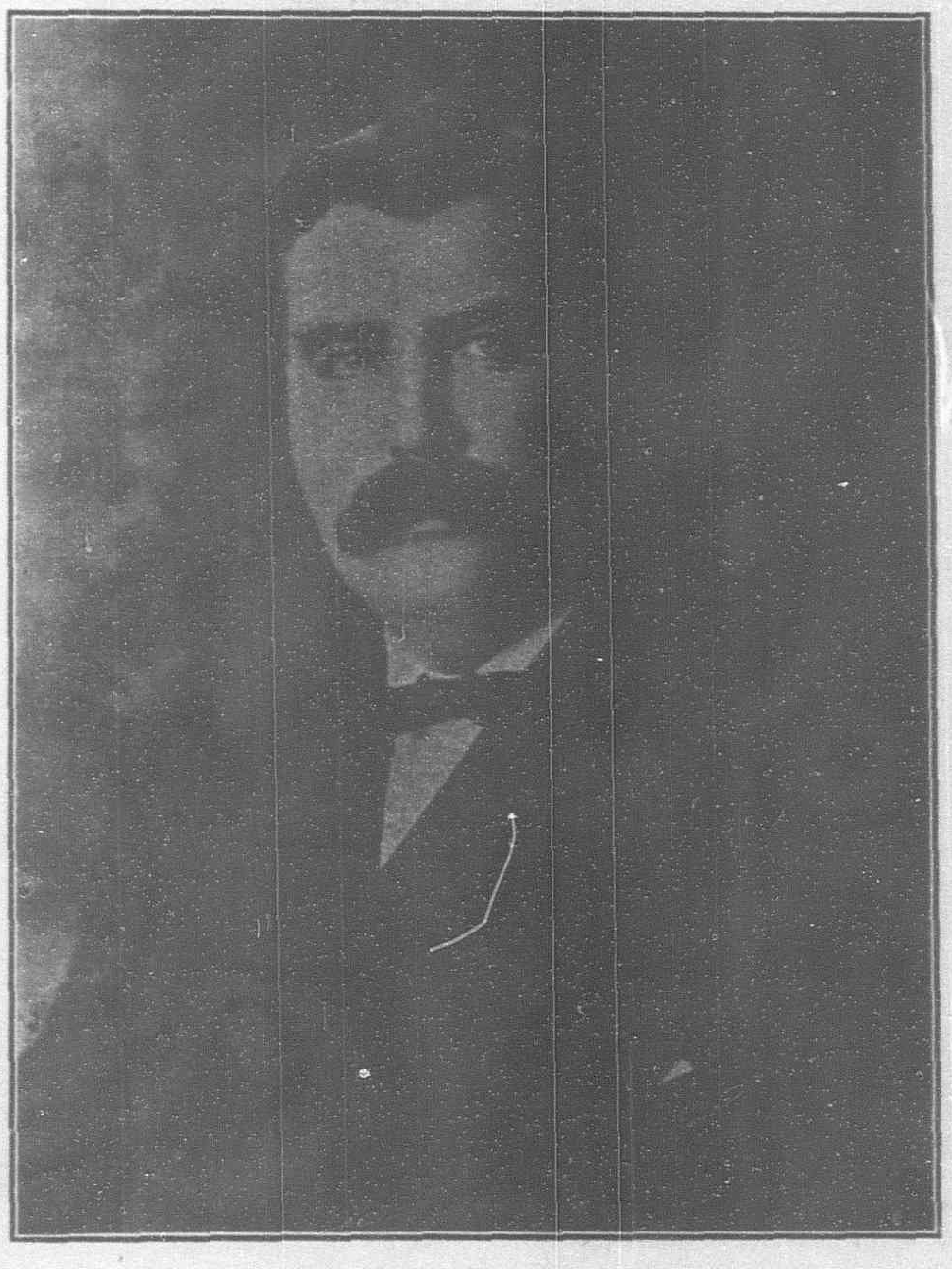
General Workmanship.—Every part and detail of the pump is of first class material and workmanship. All flanges are carefully faced and properly bolted. All nuts subject to frequent removals have been case hardened.

General Electric Company's Induction Motors Classification.

	Type	Poles	H. P.	Speed RPM	Form	Volts	Cyc. per Sec
1	IQ	10	15	720	K	220	60
2	IQ	10	17	720	K	220	60
3	IQ	8	10	900	K	220	60

Arrangement and Approximate Weights

	ARRANGEMENT		WEIGHT PER MORTOR lbs.		
	Connection	No. Bearings pully	Stator with end frame	Rotor base, etc.	Motor Complete
1	Geared	2	790	260	1050
2	Geared	2	790	260	1050
3	Geared	2	470	145	615



MR. STUART S. HARVEY

GUARANTEES.

	% Slip	Momentary Overload	Frac. of Load Efficiency %	Fraction of Load Power factor %
1	4½	75	Full 85	Full 76
2	5	75	Full 84	Full 78
3	4	75	Full 85	Full 78

All Vertical Shaft.

INDUCTION MOTORS CLASSIFICATION.

	Type	Poles	H. P.	Speed RPM	Form	Volts	Cycles per Sec
1	IQ	8	7.5	900	K	220	60
2	IQ	8	5.5	900	K	220	60
3	IQ	20	155	360	K	220	60

ARRANGEMENT AND APPROXIMATE WEIGHTS.

ARRANGEMENT			WEIGHT PER MOTOR lbs.		
	Connection	No. Bearings pully	Stator with end frame	Rotor base, etc.	Motor Complete
1	Geared	2	450	130	580
2	Geared	2	275	90	365
3	Direct	2	7720	2670	10390

GUARANTEES.

	Slip %	Momentary Overload %	Frac. of Load Efficiency %	Frac. of Load Power Factor %
1	4	75	Full 83	Full 80
2	4	75	Full 83	Full 79
3	3	100	Full 87	Full 79

All Vertical Shaft.

INSULATION TESTS.—The insulation between primary winding and core stands a test of 1000 volts, alternating current for one minute.

TEMPERATURES.—After run at rated voltage, frequency and load, the temperature of no part is more than 40° C. above that of the surrounding air, nor more than 55° C. after two hours at 25% overload. These temperatures are taken by a thermometer and are based on the assumption that the temperature of the air is 25° C. If it differs from 25° C. the rise in temperature should be corrected ½% for each degree C. that the room temperature differs from 25° C. continuous.

GENERAL DESCRIPTION.—The stationary member, or stator, is primary, the rotating member, or rotor, secondary.

The general construction is as simple as possible consistent with thorough reliability and satisfactory operation. All work on these machines indicate high class workmanship, and the design and finish of the machines produces a neat and suitable appearance.

STATOR.—The stator frame is so proportioned that the laminations and winding are supported with practically no deviation from a perfect circle. The greater part of the outer surface of the core is freely exposed, thereby obtaining the most effective ventilation.

The core is built of the best grade of thin sheet iron provided with slots on the inner circumference to receive the windings. Eddy currents are prevented by coating the laminations with japan.

The windings consist of copper conductors thoroughly insulated before being assembled, and held firmly in place by means of wedges driven into grooves in the teeth.

The insulation consists of layers of fabric treated with a special insulating compound. The quality of the insulation is such that no deterioration will take place when subject to mean temperatures, neither will it be prematurely injured if exposed to dampness. In the event of any winding being injured, it can be readily removed and another substituted by removing a few adjacent windings.

ROTOR. The rotor consists of a cast iron spider which forms the framework to support the core and windings and is mounted on the shaft.

The spider is made from the best quality of cast iron so designed as to hold rigidly in place the magnetic core and windings.

The magnetic core is composed of the best quality of laminated iron, soft, and thoroughly annealed, and of a high permeability. The laminations were completely japanned before being assembled in order to prevent eddy current losses. The laminations are clamped together by means of bolts which pass outside the core and not through it.

The windings consist of copper bars placed in the slots and short-circuiting rings at each end of core. These bars are fastened tightly in place and the over-hanging portion of the teeth serve to prevent their being displaced by centrifugal force.

The shaft consists of one piece of forged steel, accurately finished to gauge.

BEARINGS.—The bearings are self-oiling and have ample surface to insure cool running. The oil reservoirs are capable of holding a liberal supply of oil, and convenient gauges for indicating the height of the oil, and outlets for drawing it off are provided. There is also an easy means for examining the oiling device in operation.

END FRAMES.—The bearings are supported in end frames of cast iron bolted to the stator frame. The arrangement of bolts and joints is such that the end frames can be easily removed and the rotor taken out for examination or repairs. The end frames do not interfere with the free examination of the air gap.

METHOD OF STARTING.—The starting current may be cut down by means of the starting compensator connected in the primary circuit, which acts as a transformer. The compensator is furnished with a switch having one position for starting and another for running. It is further provided with several sets of taps from its windings, *any one of which can be connected* to the switch, thus making it possible to start the motor with a small or large torque and current.

INDUCTION MOTORS, DIMENSIONS

Type	Poles	H.P.	R.P.M	Volts.	Diam shaft	Width	Height over all.	Height less shaft.
IQ.	10	15	720	220	2"	24	35.5	31
IQ.	10	17	720	220	2	24	35.5	31
IQ.	8	10	900	220	1.75	19.5	34.5	30
IQ.	8	7.5	900	220	1.75	10.5	33.5	29
IQ.	8	5.5	900	220	1.50	17.5	28.5	25
IQ.	20	155	360	220	5.5	64	70	65

SWITCHBOARDS.—The panels are of natural black slate; all instruments have dull black finish; switches furnished with necessary card-holders, and the panels are mounted upon pipe supports.

Switchboard to control:

2—220 V. 5½ (A) H.P. 2-phase 60 cycle form "K" induction motors.

2—220 V. 7½ (A) H.P. 2-phase 60 cycle form "K" induction motors.

2—220 V. 10 (A) H.P. 2-phase 60 cycle form "K" induction motors.

2—220 V. 15 (A) H.P. 2-phase 60 cycle form "K" induction motors.

2—220 V. 17 (A) H.P. 2-phase 60 cycle form "K" induction motors.

2—220 V. 155 (A) H.P. 2-phase 60 cycle form "K" induction motors.

Switchboard consists of:

12—Individual induction motor panels.

2—Induction motor panels, 2 phase 60 cycle. Capacity 220 V. 5½ (A) H.P. Size 28 × 16 × 1½", on supports 64" high.

Equipment for each panel:

1—20 amp. type "R" ammeter with 20 amp. scale.

1—Mounting for compensator.

1—4 P.S.T. 2500 V. 100 amp. K-3 automatic oil switch, (main) on back of panel, with operating mechanism, and low voltage release and resistance.

2—Induction motor panels, 2-phase, 60 cycle. Capacity 220 V. 7½ (A) H.P. Size 28 × 16 × 1½", on supports 64" high.

Equipment for each panel:

1—30 amp. type "R" ammeter with 30 amp. scale.

1—Mounting for compensator.

1—4 P.S.T. 2500 V. 100 amp. K-3 automatic oil switch, (main), on back of panel, with operating mechanism and low voltage release and resistance.

2—Induction motor panels, 2-phase 60 cycle. Capacity 220 V. 10 (A) H.P. Size 28 × 16 × 1½", on supports 64" high.

Equipment for each panel:

1—30 amp. type "R" ammeter with 30 amp. scale.

1—Mounting for compensator.

1—4 P.S.T. 2500 V. 100 amp. K-3 automatic oil switch (main), on back of panel, with operating mechanism, and low voltage release and resistance.

2—Induction motor panels, 2-phase 60 cycle. Capacity 220 V. 15 (A) H.P. Size 28 × 16 × 1½", on supports 64" high.

Equipment for each panel:

1—60 amp. type "R" ammeter with 60 amp. scale.

1—Mounting for compensator.

1—4 P.S.T. 2500 V. 100 amp. K-3 automatic oil switch, (main), on back of panel, with operating mechanism and low voltage release and resistance.

2—Induction motor panels, 2-phase 60 cycle. Capacity 220 V. 17 (A) H.P. Size 28 × 16 × 1½", on supports 64" high.

Equipment for each panel:

1—60 amp. type "R" ammeter with 60 amp. scale.

1—Mounting for compensator.

1—4 P.S.T. 2500 V. 100 amp. K-3 automatic oil switch (main), on back of panel, with operating mechanism and low voltage release and resistance.

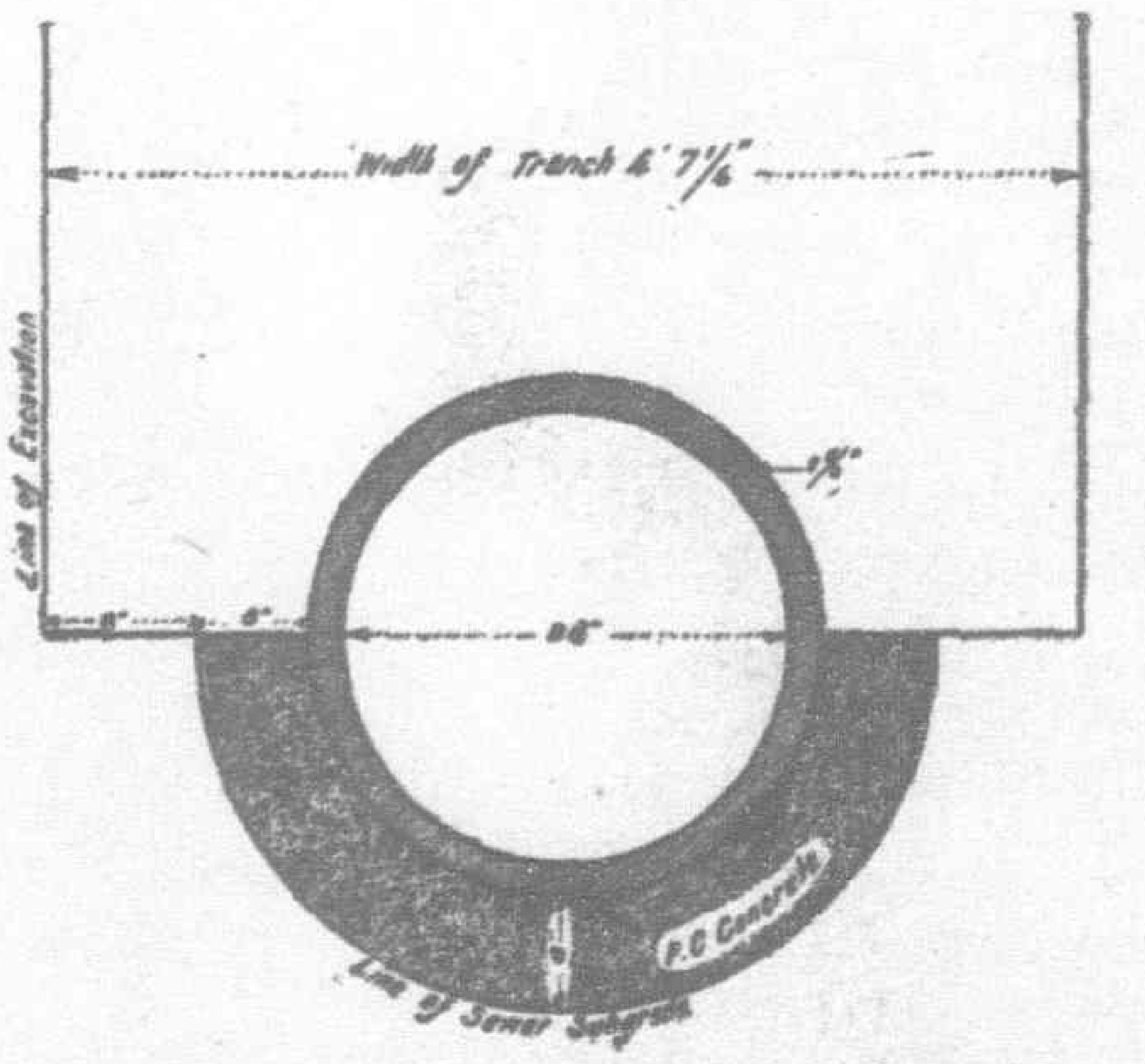
2—Induction motor panels, 2-phase 60 cycle. Capacity 220 V. 155 (A) H.P. Size 28 × 20 × 1½", on supports 64" high.

Equipment for each panel:

1—4 amp. type "R" ammeter with 500 amp. scale.

1—4 P.D.T. 4500 V. 500 amp. K-3 automatic oil switch, (main and starting), on panel, with low voltage release and resistance, and 1—4 P.S.T. 4500 V. 100 amp. K-3 non-automatic oil switch (magnetizing) on framework, with operating mechanism.

2—600 amp. D-20 current transformers.



TYPICAL SECTION FOR PIPE SEWERS

CONTRACTING NEWS

Eight Wooden Lorchas for U. S. Quartermaster's Department, Manila.—There were eight bidders, the lowest of which was Mr. Fred Wilson, Manila, ₱29,150. The other bidders were: The Cadwallader-Gibson Company, Manuel Earnshaw and Company, Juan Rodriguez, C. B. Williams, Wong Tid Company, Cho Chung Lung, and Varadero, all of Manila.

Manila Army and Navy Club Bids.—Delmar Smith, ₱213,000; R. M. Loper, ₱214,000; and the Atlantic, Gulf and Pacific, ₱221,200.

Manila Depot Commissary Stores.—Bids will be opened June 25th for the supply of 600,000 pounds of rice, 7,680 cans of jam, 200,000 pounds of granulated sugar, 30,000 pounds of butter, 3,600 cakes of glycerine soap, 35,000 bottles of effervescent water, etc.

Contract for Transporting U. S. Army Meats.—This contract has been awarded the Eastern and Australian Steamship Company.

U. S. Quartermaster's Stevedoring Contract at Manila Awarded.—This contract has gone to the Luzon Stevedoring Company. There were four bidders.

Steel for U. S. Quartermaster.—The following bids were opened for the furnishing of reinforcing steel: California Manila Lumber Commercial Co., Trussed Concrete Steel Co.'s cup bars ₱66.28 per ton of 2000 lbs., Hy-Rib ₱15.70 per 100 square feet; Findlay & Co., Twisted steel $1.94 per 100 lbs; Frank L. Strong, corrugated bars $1.815 and $1.925 per 100 lbs; H. W. Peabody & Co., corrugated bars $34.64 and $36.74 per ton of 2000 lbs; Atlantic, Gulf & Pacific Co., corrugated bars ₱0.0372 per lb.

Furniture for the United States Army.—The contract for the manufacture of 800 dining chairs, 2,400 side chairs, and 400 sideboards was awarded the Cadwallader-Gibson Lumber Co. This company manufactures the well-known Gibson furniture. The contract represents about $60,000. The prices were: dining room chairs, $5.45, other chairs, $4.45, and sideboards, $29.45 each.

Shanghai Municipality, Cement.—Tenders for the supply of Portland Cement in such quantities as may be required to be opened by the Council June 28th.

Shanghai Municipal Coal Contract.—The Mitsui Bussan Kaisha secured the contract at Tls. 6.25 per ton for the year. The other bidders were: Messrs. Johnsen, and Herlofsen Shimoyamada, Tls. 5.60; Sander, Wieler & Co., Otokiri gomi, Tls. 6.50; F. Caissial & Co., Takaye, Tls. 7.00; Ohnour, Tls. 6.80; Yahsia, Tls. 6.50; Mitsui Bishi Co., Hojo, Tls. 7.00 and one irregular.

U. S. Naval Supplies.—Bids were opened June 1st covering the supply of over half a million dollars worth of supplies as follows: Castle Brothers-Wolf and Sons were the only bidders for supplying 1,700,000 lbs. fresh frozen beef, 80,000 pounds of mutton and 50,000 pounds of veal. The figures for beef delivered at Cold Stores, on lighter in Manila Bay, and at Cavite being .1850, .18 and .19 centavos per pound, respectively; mutton .1590, .155 and .165, respectively; veal .2690, .25 and .26 centavos, respectively.

Bids were also opened for 300,000 pounds of beans, 30,000 lbs. tea, 150,000 lbs. rice, 30,000 lbs. sauerkraut, 20,000 lbs. corn meal, 15,000 lbs. cream cheese tinned, and 10,000 lbs. fresh.

Ah Gong bid: beans .15 ctvos. lb., tea .85, rice .0635, sauerkraut .15, corn meal .20, cream cheese, tinned and fresh .60.

Castle Bros.-Wolf & Sons bid to deliver at Manila and Cavite, respectively, as follows: beans .114 and .115, tea .538 and 685, rice .0462 to .05, sauerkraut .137 and .135, corn meal .171 and .169, cream cheese tinned .56, .65, and .558, .6487, cream cheese fresh .43 and .428.

The Manila Import Co. bid on tea for Manila del .55, and Cavite .52 lb., and on rice .0477.

Holliday, Wise and Co. bid only on rice at .0424 per pound. Rosario Vizcarra bid on a number of samples of tea, his prices ranging from 50 to 66 centavos per pound; rice .0489.

Sprungli and Company bid .559 on tinned cheese and .435 on fresh.

The bids tendered for the supply of 600,000 pounds of granulated cane sugar were received from Findlay and Company and Castle Bros.-Wolf and Sons, both firms submitting prices for delivery at Cavite, Manila and at Hongkong, and in cases and sacks, as follows: Findlay & Co. in cases, at Cavite, Manila and Hongkong: .0873, .08695 and 081, per pound, respectively, and in sacks .071, .07067 and .067. Castle Brothers' lowest bids for delivery in cases at Cavite, Manila and Hongkong, were .0895, .088 and .086, and in sacks .0746, .0721 and .07.

Bids were also opened for 200,000 pounds of Australian butter as follows: Castle Bros., .695 and .665 per pound; Holliday, Wise and Company .637, and Sprungli and Company .709.

On 10,000 fire brick the bids, with prices per hundred brick, were as follows: Rosario Vizcarra ₱13; Fred Wilson ₱9.25 and ₱9.50; Ker & Co. ₱9.50 and ₱9.85: Findlay & Co. ₱9.49; Macondray 3,500 only at .10¾ ea.; J. Parsons ₱9.90 and Wm. H. Anderson ₱100 for the lot.

Cast Iron Pipe and Specials, City of Manila.—Bids were opened June 10th for the supply of 7,000 tons of cast iron pipe, hub and spigot pattern; 46 tons of 20 inch flexible joint and flange cast iron pipe; two tons of flanged cast iron pipe and about 200 tons of specials, and the contract awarded the Atlantic, Gulf and Pacific Company. The price was $227,000 U. S. Currency. The pipe will be supplied by Messrs. Macfarlane, Strong & Co. of Glasgow.

Imperial Tientsin-Pukow Railway.—Steel plate girders to be delivered on wharf at Pukow during the month of May, 1910. Quotations in sterling and received by Managing Director at Nanking not later than June 20th, 1909:

12 Spans of Deck Girders, 12 feet clear span;
8 Spans of Deck Girders, 20 feet clear span:
150 Spans of Deck Girders, 30 feet clear span;
30 Spans of Deck Girders, 50 feet clear span;
8 Spans of Deck Girders, 75 feet clear span.

Imperial-Tientsin-Pukow Railway.—Rolling Stock for Southern Section. To be delivered at wharf, Pukow, in January, 1910. Tenders addressed Managing Director, Nanking, to be opened June 25, 1909.

For 100 High Sided Wagons (30 tons); 100 Low Sided Wagons (30 tons); 50 Covered Goods Wagons 20 tons).

Also eight tender locomotives 2-6-0 type, cylinders 19″×24″. Coupled Wheel 5′-0″ diameter. Working pressure 180 lbs. With six wheel-tenders.

The locomotives and tenders to be delivered on the railway wharf at Pukow; four locomotives to be delivered during the month of April 1910, and the remaining four during the month of August 1910.

Tenders should be addressed to the Managing Director, Tientsin-Pukow Railway, Southern Section, Nanking. They will be opened at 10 a. m. on Tuesday, the 29th June, 1909.

Office of the Municipal Board.—Manila, P. I., February 15, 1909.

Sealed bids or proposals will be received by the secretary of the Municipal Board, Manila, P. I., until 12 o'clock m., July 1, 1909, for furnishing gate valves, air valves and fire hydrants for the city of Manila, Philippine Islands.

The total amount to be furnished will be approximately one hundred and sixty (160) gate valves, twenty (20) air valves, and three hundred and twenty-five (325) fire hydrants

Specifications, general plans, and blank forms of proposal may be obtained at the office of the secretary of the Municipal Board, Manila, P. I., or from the Chief of the Bureau of Insular Affairs, Washington, D. C.

Each proposal must be accompanied by a certified check for three thousand dollars ($3,000), United States currency, drawn on a local bank; or a bond in like amount, signed by a fidelity insurance company, authorized to give such bond in the Philippine Islands, as a guaranty that the bidder, if awarded the contract, will, after due notification, promptly enter into contract and furnish an acceptable bond in the sum of twenty (20) per cent of the sum total of the contract price for the faithful performance of the work.

The right is reserved to reject any or all bids.

H. L. Fischer,
Secretary of the Municipal Board.

J. F. Case,
Chief Engineer, Department of
Sewer and Waterworks Construction.

Imperial Tientsin-Pukow Railway.—Tenders invited, to be opened June 21st, 1909, by the Managing Director at Nanking China, for the furnishing free of all charge at the wharf at Pukow, not later than December 31st, 1909, Steel Plate Girders as follows:

26 Spans of Deck Girders, 12 feet clear span;
12 Spans of Deck Girders, 20 feet clear span;
60 Spans of Deck Girders, 30 feet clear span;
12 Spans of Deck Girders, 50 feet clear span;
2 Spans of Through Girders, 50 feet clear span;
3 Spans of Deck Girders, 75 feet clear span;
3 Spans of Through Girders, 75 feet clear span.

Quotations in sterling and bids must be presented on or before June 20, 1909.

Proposals for Construction of Six Steam Launches.—Headquarters Philippines Division, Office of Chief Quartermaster, Manila, P. I., May 20, 1909. Sealed Proposals, in triplicate, subject to the usual conditions, will be received here until 10:00 a.m., July 15th, 1909, and then opened, for the construction and delivery of Six Steam Launches. Blank forms, plans and specifications furnished upon application to this office and to the representative of the Consular Service of the United States at Hongkong, Shanghai and Singapore. Envelopes containing proposals should be endorsed "Proposals for construction of six Steam Launches, to be opened at 10:00 a.m., July 15th, 1909" and addressed to the Chief Quartermaster, Philippines Division, Manila, P. I.

Proposals for Repairing the U. S. A. T. "Warren."—Headquarters Philippines Division, Office of Chief Quartermaster, Manila, P. I., May 15th, 1909. Sealed Proposals, in triplicate, subject to the usual conditions, for repairing the U. S. A. T. "WARREN," will be received here until 10:00 a.m., July 10, 1909, and then opened. Information and blank forms furnished upon application to the Representative of the Consular Service of the United States at Hongkong, Shanghai, Singapore and Chief Quartermaster, Philippines Division, Manila, P. I. Envelopes containing proposals should be endorsed "Proposals for repairing the U. S. A. T. 'WARREN,' to be opened at 10:00 a.m., July 10, 1909," and addressed to the Chief Quartermaster, Philippines Division, Manila, P. I.

Proposal for Rope.—Headquarters Philippines Division, Office of Chief Quartermaster, Manila, P. I., June 12th, 1909. Sealed proposals, in triplicate, subject to the usual conditions, for furnishing and delivering approximately 300,000 lbs. (30% more or less) of rope including all standard sizes from six thread heaving lines to eight inch towing lines, will be received here until 10:00 a.m., July 12th, 1909, and then opened in the presence of attending bidders. Certified check or guaranty in 10% of the amount of the bid must accompany each proposal. Blank forms and information furnished upon application. Envelopes containing proposals should be endorsed "Proposals for Rope, to be opened at 10:00 a.m., July 12th, 1909," and addressed to the Chief Quartermaster, Philippines Division, Manila, P. I.

FAR EASTERN ENGINEERING, CONSTRUCTION, COMMERCIAL AND FINANCIAL NEWS

ELECTRIC RAILWAYS, LIGHT, POWER, TELEGRAPHS, TELEPHONES, AIRSHIPS, ETC.

Dairen Electric Railway.—The work on this system is progressing rapidly and traffic will begin on a number of streets in July.

To Manufacture Telegraph Supplies.—Peking is contemplating establishing a plant to manufacture equipment for the Chinese telegraph system.

Long Distance Telephones in Kwangtung.—It is proposed to connect all the towns in the peninsula with a view to utilizing the service for police purposes.

Wireless in Burma.—A wireless service has been inaugurated connecting Mergui, Victoria Point, Rangoon and Calcutta. This service was inaugurated in February.

Tokyo-Narita Railway.—A scheme is being floated to connect these two points with an electric road and an effort is being made to raise the necessary funds in London.

Canton Electric Company.—The Viceroy of Kwangtung has been negotiating, through the firm of Messrs. Shewan Tomes & Co., for the redemption of this company. The price will be in the neighborhood of $1,500,000.

Wuhu Electric Light Company.—This company is equipped to provide 6,000 lights of 16 candle power each and there is every indication from the orders filed for service that the present capacity will soon have to be increased.

Hongkong Telephones.—The announcement was made at the meeting of the Oriental Telephone Company that the China and Japan Telephone Company intended connecting Kowloon and Canton as soon as the railroad between these two points was completed.

Japanese Electric Railways.—At the end of February the Railway Board announced that there were 61 chartered roads in Japan which included a chartered mileage on the roads wholly or partly in operation of 342 miles and an inaugurated mileage of 197 miles.

German Colonial Wireless.—The German Government is interested in a plan to connect the South Sea Islands by wireless and also to put them in direct communication with the outside world. This system will include all the German colonies in the Pacific and later include the other islands.

F. M. S. Telegraph Line.—The land line between Kuala Lumpur and Singapore was open for business May 17. This means a reduction on messages from 25 cents a word by way of Penang and 13 cents a word by way of Malacca, to three cents a word only. This line is under the control of the Bureau of Posts and Telegraphs.

Chinese Railway Telegraph Lines.—It is proposed to have the telegraph lines along the railways in China included in the Imperial system and the management of the Peking-Hankow, Peking-Mukden-Chenting-Taiyuen, Pienchow-Lohyang and Taokow-Tsinghwa companies have been directed to connect their railways under the direction of the telegraph company.

Philippine Wireless.—The Philippine Government has provided for the establishment of eight wireless stations as follows:

"Maasin, Leyte, Surigao, and Mambayao in Misamis; Cuyo, Culion, and Puerto Princesa in the province of Palawan; Bojeador, Ilocos Norte; and Basco, Batanes Islands. The amount appropriated for this purpose is ₱170,000."

Japan's Light and Power Plants.—Consul General Babbitt in his report from Yokohama says that the generating industry in Japan at the end of 1908 developed:

"Steam, 54,550 kilowatts; water, 31,951 kilowatts; gas, 105 kilowatts; total, 86,606 kilowatts, an increase of 12,090 as compared with 1907. It was worthy of special notice that the Tokyo Electric Light Company succeeded in the high transmission of 55,000 volts over a distance of 47 miles, from Katsura to Tokyo."

RAILWAYS AND RAILWAY SUPPLIES

South Manchuria Railway School.—There were 644 pupils enrolled in this school March 31st.

Canton-Kowloon Railway.—The Governor of Hongkong places the excess of cost of this line at $1,000,000 over the estimates.

Kirin-Changchun Railway.—The sites for the depot and the other buildings for the proposed railway have been selected. This is the first indication of activity.

Kiangsu Railway.—The opening of the section of the railway to Fengching took place on May 30th. It is expected that this line will be completed about 1911.

South Manchuria Railway.—The gross earnings for the six months ended March 31st amounted to Yen 10,109,000 an increase of yen 2,568,400 over the corresponding term 1908.

Peking-Kalgan Railway.—It was expected that the entire line to Kalgan would be opened at the end of June. The line to Huayen was in operation, a distance of 30 li from Kalgan last month.

Want Swing Railway Bridges.—The Chinese Chamber of Commerce at Tientsin has filed a petition with the Tientsin-Pukow Railway authorities asking that the rivers be spanned by swing bridges.

New Honan Railway.—The correspondent of the *Peking and Tientsin Times* at Changte writes that Chinese surveyors have completed the survey of a line connecting Changte with the coal regions about 80 li westward.

The Anhwei Railways.—It has been announced that Messrs. Pauling will finance this system. The loan will be for Tls. 16,000,000 and represents the estimated cost of construction and equipment of 800 li or 266 miles of lines.

Canton-Macao Railway.—The syndicate organized to construct this line will probably be granted its franchise next month. It is understood that the line in Chinese territory will be built by Chinese and the Portuguese section financed by the Banco Nacional Ultramarino.

Hongkong Peak Railway.—The consideration of four alternate routes for this line is being considered as follows:

"(1) a tunnel under the Gardens, (2) a line on the surface of Glenealy Ravine, (3) a line on high trestles in the Ravine, (4) a wide cutting through the Public Gardens. There is much opposition to the line cutting through the public gardens.

Capital invested in Japan's Railways.—Following is the summary of the capital represented:

	Yen.
Price paid by Government for the 17 Nationalized Railways	481,981,471
Private Lines	148,493,290
New Constructions in 1908	30,000,000
Total	660,474,761
Special Capital	96,991,239
Grand Total	757,466,000

South Manchuria Railway Construction.—The following is the program announced for the year:

"New Workshops at Shanokou, near Dairen; preliminary work for Yamato Hotel, Dairen; completion of Yamato Hotel, Changchun; completion of Mukden Station; Church, Theatre, Colliery Club and Chief Engineer's Mansion for Fushun; Market-Places for Wafangtien and Tashihchiao; elementary schools for Liaoyang and Changchun; slaughter houses for Liaoyang and Kunchuling; roads for Liaoyang, Mukden, Tiehling, Kungchuling and Changchun; waterworks for Liaoyang, Mukden, Tiehling and Changchun.

PUBLIC WORKS, DOCKS, WHARVES, ETC.

Another Proposed New Port.—There is some talk among the Cantonese to develop a port at Nanshui, near Canton.

Whangpoo Conservancy Test.—The passage of H.B.M.S. Astraea through the new junk channel was made successfully and at no point was there found less than 28 feet of water while a depth of 34 feet and upwards was recorded at different points.

Strengthening Yangkingpang Bridges.—For the purpose of strengthening these bridges so that the two tramway companies of Shanghai may run a common service a conference between the Chief Engineer of the concession and the municipal engineer has been held.

Hunchun Port Improvements.—This port situated about 60 miles from the mouth of the Tumen is to be developed by the Kirin provincial government with a view to open it up to steamer traffic. The sum of Tls. 600,000 has been recommended expended by the authorities.

Tsuruga Harbor.—The sum of yen 800,000 will cover the cost of the work proposed to improve the harbor of this Japanese port which is to cover an area of 54 acres dredged to a depth of 24 feet at low tide. Breakwaters will be extended and warehouse built so as to bring it up to a modern standard of convenience to shipping.

British Appropriations for Far Eastern Consular Buildings.—Under the heading of New Works, Alterations, Additions, and Purchases (including Furniture in connection therewith), are the following votes;—Changsha: Erection of new Consulate, £1,000; Mukden: Erection of new Consulate, including residences for Assistants, stables, etc., £7,000; Newchwang: Installation of electric light and bells, £160; Peitaiho: Erection of summer quarters for the Peking Legation, including furniture (revote £900), £3,000; Peking: Improving water supply to residences, £550; Peking: Erection of cowshed, £180; Peking: Erection of house for Chinese Secretary, £500; Peking: Extension of electric lighting, £500; Tientsin: Addition to offices, £100; Acquisition of new sites in China, Japan, and Korea, £1,000.

Kushiro Harbor Works.—The following description is given of the first part of extensive improvements to the port by British Consular reports:

1. A breakwater will be constructed, with a total length of 4,150 ft., starting from the cliffs to the west of the Kushiro lighthouse, and enclosing a harbor with an area of over 446,000 tsubo (368 acres). A further prolongation of 1,500 ft. will give an area of over 612,000 tsubo (506 acres). 2. Diversion of the River Akan and construction of an embankment at the mouth of the river. Each bank of the new rivermouth is to be extended by an embankment 1,900 ft. long which is to be erected so as to prevent the mouth being silted up with sand during high seas. 3. A groin is to be constructed in a south-westerly direction from the right bank of the mouth of the Kushiro. This will have a length of 1,930 ft., and will enclose the harbor, thus preventing the sand from being carried into it. 4. The harbor will be divided into two sections. The first section will be dredged to a depth of 26 ft. at low water, and the second to a depth of 12 ft. The estimated cost will be 4,759,541 yen (about £486,000), spread over 12 years.

SHIPBUILDING, GENERAL MARINE AND FISHERIES

Blue Funnel Line Active.—The Blue Funnel line is building four new liners for the purpose of entering the trans-Pacific trade.

Shanghai-Ningpo Steamship Company.—This company has purchased a steamer from the Peking Government for Tls. 300,000.

Kwangtung Deep Sea Fishing.—The Marine Products Association will soon introduce the use of trawlers in the territorial waters of the leased territory.

Nippon Yusen Kaisha Fleet.—The fleet owned by this company comprises 80 steamers ranging from 700 to 8,500 tons aggregating about 300,000 tons.

Dairen Branch of the Kawasaki Dockyard.—The announcement is made that this branch is now equipped as thoroughly as the home establishment.

Formosa Shipping.—The total tonnage entering and clearing Formosan ports during the year 1908 was 462,670 tons, an increase over 374,890 for the previous year. This is largely due to the deepening of Keelung harbor.

New Japanese Cruisers.—An order each has been placed with the Mitsu Bishi Dockyard, Nagasaki, and the Kawasaki Dockyard, Kobe, for the construction of a 5,000 ton cruiser of high speed which will be completed by 1912. They will be utilized for dispatch vessels in time of war.

Osaka Shosen Kaisha's New Steamers.—The Tacoma Maru, one of six new steamers for the run connecting with the Chicago, Milwaukee, and St. Paul Railway via Seattle, was recently launched from the Kawasaki Dockyards. Her dimensions are: Lengths pps. 410′, Breadth md, 51′3″, Depth md. 32′ 6″. Tonnage: Displacement—12,000 tons, Gross Reg.—6,178 tons, Net Reg.—3,833 tons. Class: Lloyd's 100 A-1, with twin Screws; Speed: 15½ knots per hour; Electric Lighted and Steam Heated.

MINES, MINERALS AND THE METAL TRADE

Batan Coal Company.—This company has been installing new machinery and its coal has proved very satisfactory.

Rich Strike at the Raub.—A lode was struck in the Anderson shaft reported to be sixty inches wide and carrying gold to the amount of 20 dwt. to the ton.

New Chinese Iron Works.—The Viceroy of Chili and the Governor of Shanghai have been instructed by Peking to establish a works plant in Shansi along similar lines to the Hanyang.

Burma Oil Wells.—The rich strata of oil recently struck by Jamal Brothers at the Yenangyaung oil fields has now been tapped by both the Burma Oil Company and the Rangoon Oil Company with greater flow than at first obtained. This oil was tapped at a depth of 1,350 feet, being the greatest depth yet reached in the Burma oil fields.

Philippine Mining Activity.—The Paracale placer fields continue in active development. Several new dredgers will soon be installed; a twenty stamp mill is being placed in the San Mauricio quartz property and a number of new companies are being organized. In Benguet several deals have been concluded, among them the sale of a one-tenth interest in the Headwaters Mining Company by Nels Peterson to Hongkong capitalists through Governor Whitmarsh for ₱40,000.

FINANCIAL AND MISCELLANEOUS

Formosan Rice Crop.—The total area under rice during 1907 was 788,470 acres and the crop 44,760,800 bushels.

Industrial Bank Debentures.—This institution has issued its fourteenth debentures to the amount of yen 2,000,000 drawing 5.5%.

Chartered Bank Agency in F. M. S.—It has been decided to establish its branch at Tongkah and the site for the building has been selected.

Kyoto Municipal Loan.—The flotation of a yen 5,000,000 loan has been successful. It was taken up by the Mitsui and other Tokyo Banks.

Kirin Branch of Great Chinese Bank.—The city of Changchung has been selected as the location for the Kirin branch and it is now open for business.

Large Order for Manila Cigars.—The United Cigar Stores of the United States have placed an order in Manila for 12,000,000 cigars to be shipped upon the passage of the Payne Bill.

Bank of Formosa.—This institution proposes to establish branches at Canton and Bangkok in addition to its present connections and to increase its capital from five to ten million yen.

Manchurian Medical Society.—The recently organized society held a general meeting at Dairen last month and Major General Miura of the medical corps of the Japanese army was elected chairman.

Hainan Financial Agency.—A Straits Chinese millionaire has started a bank on the island of Hainan for the purpose of financing enterprises formed for the purpose of developing the mining resources.

Rope Manufacturing Combine.—The Tsukishima, the Tokyo and the Nippon rope manufacturing companies have amalgamated their interests and the combine is capitalized at one and one-half million yen.

Kirin Developing Co.—A company is being promoted by Chinese capitalists from Hongkong with a capital of Tls. 30,000,000 for the purpose of developing the resources of Kirin province and especially the lumber and mining.

Formosan Tea Export.—For the year 1908 there were exported from Formosa 17,693,739 pounds of Oolong and 5,547,200 pounds of Powchong. The average price realized on Oolong was 14 cents and on Powchong 12 cents.

Harbin Beet Sugar Refinery.—Chinese promoters with a capital of yen 500,000 have selected a site for a large beet sugar factory and have acquired a large tract of land for the purpose on lease. The first crop will be taken off next year.

Bent Wood Furniture Manufacture in Japan.—A factory at Tokio is now in successful operation and it is expected that it will supply the demand presented heretofore by the importation of that class of article to the amount of $100,000.

*LONDON, ENGLAND, METAL MARKET

May 1909.

COPPER	£ s. d.		£ s. d.
*Tough cake and Ingot	60 15 0	..	61 5 0
*Best Selected	61 0 0	..	61 10 0
*Electrolytic	61 0 0	..	61 10 0
*Sheets and sheathing	71 0 0	..	—
*Flat bottoms	74 0 0	..	—
STANDARD †Cash	57 11 3	..	57 13 9
STANDARD †Three Months	58 5 0	..	58 7 6
*Copper tubes, seamless per lb.	0 0 9½	..	—
*Lake	61 10 0	..	62 0 0

* Less 3½ per cent. † Net.

ALLOYS.

Brass: Wire	0 0 6½	..	—
,, Tubes (solid drawn)	0 0 7¾	..	—
,, Sheets	0 0 6¾	..	—

TIN.

English ingots, f. o. b.	130 10 0	..	131 10 0
,, bars	131 10 0	..	132 10 0
,, refined	132 10 0	..	133 10 0
Straits... Cash	131 0 0	..	131 5 0
Straits... Three months	132 0 0	..	132 5 0
Australian spot	131 0 0	..	131 10 0
Banka (in Holland) Cash	134 12 6	..	—
Banka (in Holland) Three months	135 1 3	..	—

LEAD.

Spanish or soft foreign	13 5 0	..	13 7 6
English pig, common	13 7 6	..	13 12 6
,, L. B.	14 0 0	..	—
,, sheet and bar lead	14 10 0	..	—
,, pipe	15 0 0	..	—
,, red	16 5 0	..	—
,, white	18 0 0	..	—
,, patent shot	16 10 0	..	—

SPELTER.

Silesian ordinary brands	21 12 6	..	21 15 0
,, special brands	22 2 6	..	22 7 0
English Swansea	22 0 0	..	22 10 0
Sheet zinc	24 15 0	..	—

ANTIMONY.

Antimony	30 0 0	..	32 0 0
,, Crude	13 10 0	..	14 10 0
,, Ore (basis 50%)	7 10 0	..	8 10 6

QUICKSILVER.

Flasks, 75 lbs. warrants	8 7 6	..	—

MANGANESE.

Ore, c.i.f., U. K. ports.	Per unit.		Per unit.*
1st quality, 50 per cent. and upwards	0 0 9	..	—
2nd quality, 47 per cent. to 50 per cent	0 0 8	..	—
3rd quality, 40 per cent. to 47 per cent	0 0 7	..	—

* Unit corresponds to 1 per cent.

ALUMINIUM.	Per ton.
98-99 per cent	£60 to £65

NICKEL.	Per ton.		Per ton.
98-99 per cent. guaranteed	170 0 0	..	175 0 0

PLATINUM.

Per oz. Troy, 100s.; nominal and subject to negotiation.

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*Mining Journal.

CURRENT NEW YORK WHOLESALE PRICES OF METALS, MINERALS, CHEMICALS, ETC.

Selected from the Engineering and Mining Journal

Abrasives.—		U. S. Currency.
Bort, good drill quality	carat $	85.00
Carborundum, grains	lb	.10-.17
Corundum	"	.07-.10
Emery, grain	"	.035-.045
Pumice Stone, American powdered	100 lbs	1.60-2.00
Acids.—		
Hydrochloric 20°	lb	1.25-1.50
Nitric, 38°	"	4.25-4.625
Sulphuric, 66° bulk	ton	18 00
Aluminum, Sulphate Com'l	lb	1.10-1 75
Antimony, needle	"	.05-06
Arsenic, white	"	.05-055
red	"	.07½-.70
Asphaltum.—		
Trinidad	ton	2 00-30.04
California	"	21.00-27.00
Bleaching Powder, 35%	100 lbs	1 25-1.00
Blue Vitriol	lb	5.00
Bone Ash	"	.02¾-.04
Borax	"	.04½-05½
*Caps detonating	M	-7.50
Cement.—		
Portland, American	500 lbs. bbl	1.55-1 60
Foreign	" " "	2 25-2.90
Rosendale	300 " "	.85
*Green Island	375 " "	2.75
*Alsen		3.00
Clay, China.—		
American common	lg. ton	8 50-9.00
Foreign	"	10.00-17.50
***Coals.—**		
Batan, at Mines	ton	3 00
Australian	"	5 50
Copper	lb	.13-.14
*Dynamite 40%	"	.20
Feldspar ground best	sh. ton	10 50-15.00
Fire Brick, American	M	30.00-40 00
Imported	"	30.00-45.00
Fire clay, St. Louis Mill	ton	2 50
Fuse—Blasting	1,000 ft	7 50
Graphite—Ceylon, lump	lb	.04-.10
Large lump	lb	.07-.10
Gypsum—Fertilizer	sh ton	7.00
Powdered	sh. ton	12.00-20.00
Lead	lb	-.04
Magnesite-Greece, crude, 95%	lg. ton.	8.00-10 00
Bricks, domes	per M	160-200
Manganese, Ore, 80-85%	sh. ton	20.00-50.00
Mercury, export flask	75 lbs	36.00-39.00
Paints and Colors.—		
Litharge American P'w'd	lb	.06½-.06¾
Ochre, Am. Com	sh. ton	8.50-9.00
Paris green, pure, bulk	lb	.26
Turpentine, spirits, bbl	gal	.44½-.4
White lead, Am. dry	lb	.05¾-0
Am. in oil	"	.06½-.06
Zinc, white, Am. extra dry	"	.05¾-.05
Phosphates, Acid	per unit	.65-.7
Florida hard rock	lg. ton	10.25-10 5
Land pebble 68%	"	5.25-5.5
Potassium Cyanide (98-99%)	lb	.18-.19
Platinum	oz	28.00
Platinum, Scrap	oz	17.00
Spelter	lb	.045-.046
Nickel Small lots	lb	.50-60
*Powder, black blasting A	lb	.15
*Judson	"	.14½
Pyrite, Domestic Non-arsenical, Lump	unit	.11-.11½
Imported non-arsenical lump	"	.12½-.13
Imported, arsenical	" "	.12-.12½
Saltpeter crude	100 lbs	4.50-5.00
Silica, Lump quartz	lg. ton	5 00-6.00
Ground quartz, ordinary	"	13 00-15.00
Glass sand, ordinary	"	2.7
Silver	oz	.55¼-.55
Sodium cyanide (100% KCN)	lb	.1
*Steel, octagon drill	lb	.
Sulphur, Louisiana prime	lg. ton	22.
Roll	100 lbs	1.85-2.
Flowers sublimed	"	2.20-2.
Talc—Domestic	sh. ton	15.00-25.
Italian, best	"	35.00-40.
Tin	lb	.9½
Zinc, Sheet	100 lb	7.
Dust	lb	.05¾-.06

*Manila quotation.

HEMP STATISTICS, 31st MAY, 1909.

(Courtesy of C. S. Nicholson, *Secretary, Manila Chamber of Commerce.)*

EXPORT OF HEMP, MAY, 1909.

Date		Vessel	London	L'pool	Atlantic U.S.	Pacific East & California	Continent.	Australia	Other Pts.	Total Bales
1909			87,877	46,119	150,751	25,119	24,130	4,938	13,094	352,028
May	1	Zafiro	2,000						100	2,100
"	4	Cranley	1,250							1,250
"	6	Aldenham							455	455
"	7	Rubi							500	500
"	"	Nikko Maru							131	131
"	"	Tydeus	8,010	8,225			2,800			19,035
"	4	Sungkiang...Cebu		350						350
"	"	Taming							150	150
"	11	Tean		750					69	819
"	14	Zafiro		500			1,050			1,550
"	"	Falls of Nith..Cebu	3,514				350			3,864
"	"	Suveric			4	8,290				8,294
"	"	Yuensang							200	200
"	"	Antilochus				2,573				2,573
"	18	Isla de Panay		1,750			121			1,871
"	"	Taming		600						600
"	"	Kaifong ......Cebu		1,185						1,185
"	17	Taiyuan						215		215
"	"	Yawata Maru						1,350		1,350
"	"	Croydon							75	75
"	21	Rubi							400	400
"	23	Manila						700		700
"	25	Falls of Nith	7,972	750			1,125			9,847
"	"	Tean		570						570
"	"	Zafiro	5,200						250	5,450
"	"	Sungkiang...Cebu		2,500						2,500
"	28	Yuensang	200				4			204
"	25	Kennebec			8,970					8,970
"	26	Prinz Waldemar							60	60
			116,023	63,299	159,725	35,982	29,580	7,203	15,484	427,256

FAR EASTERN STOCKS AND QUOTATIONS

Courtesy of Messrs. Kadoorie & Co., Hongkong, May, 1909.

STOCK.	WHEN ESTABLISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	AT WORKING ACCOUNT	DATE	LAST DIVIDEND.	Approximate Yield per cent. per annum at Present Quotation	CLOSING QUOTATIONS.
BANKS.											
Hongkong & Shanghai Banking Corporation	1865	$15,000,000	120,000	$125	$125	s £1,500,000 g $14,500,000 i $250,000	$2,006,234	31-12-08	Final of £2-and bonus of 5/- @ ex 1/8 ¾=$26.024, making in all $47.966 for 1908	5¼	$980 buyers £90
National Bank of China, Ld.	1891	£699,475	10) 99,925	£7	£6	c £4,099 $150,000	$10,223	31-12-07	$2 (London 3/6) for 1903	....	$51
MARINE INSURANCES.											
Canton Insurance Office, Ld.	1881	$2,500,000	10,000	$250	$50	$1,560,000 j $232,757 u $411,990	Nil.	31-12-07	$14 for 1907	7¼	$197½ sales
North China Insurance Co., Ld.	1863	£150,000	10,000	£15	£5	g £125,000 s Tls. 150,000 u Tls. 303,747 f Tls. 118,277	Tls. 160,512	30-6-08	Interim of 7/6 for % 1907	5½	Tls. 104 buyers
Union Ins. Society of Canton, Ld.	1867	$3,100,000	12,400	$250	$100	s $3,000,000 g £90,000 f $192,248 j £105,249 u $682,609	$2,464,901	31-12-08	Final of $17 making $47 for 1907, and interim of $30 for account 1908	5¾	$845 sales
Yangtsze Ins. Association, Ld.	1862	$1,200,000	12,000	$100	$60	$1,000,000 j $294,405 f $199,234	$707,637	31-12-08	$12 and bonus $3 for 1907	7½	$225 buyers
FIRE INSURANCES.											
China Fire Ins. Co., Ld.	1870	$2,000,000	20,000	$100	$20	$1,000,000 z $438,668 f $13,802	$375,314	31-12-08	$6 and bonus $2 for 1907	7	$110 buyers
Hongkong Fire Ins. Co., Ld.	1868	$2,000,000	8,000	$250	$50	$1,438,173	$368,711	31-12-08	$27 for 1907	8	$345 sales
SHIPPING.											
China & Manila Steamship Co., Ld.	1882	$750,000	1) 30,000	$25	$25		*Dr.* $21,538	31-12-08	$1 for 1906	....	$11 sellers
Douglas Steamship Co., Ld.	1883	$1,000,000	20,000	$50	$50	$264,638 i $99,067	Nil.	30-6-08	$2½ for year ending 30-6-08	....	$36
Hongkong, Canton & Macao Steamboat Co., Ld.	1865	$1,200,000	80,000	$15	$15	e $250,000 d. i. $607,500 f $ 79,428 $ 25,344	$20,279	30-12-08	Final of $1½ making in all $2½ for 1908	7¾	$32 buyers
Indo-China Steam Navigation Co., Ld. (Preferred) Do. Do. (Deferred)	1882	*m* £600,000	2) 60,000 2) 60,000	£5	£5	£10,000 i £240,000	£13,700	31-12-07	6/- for 1907 on pref. shares only at ex. 1/9 11/16, $3.154	4	$73 buyers
Shanghai Tug & Lighter Co., Ld. Do. Preference	1903	Tls. 1,500,000	20,000 10,000	Tls. 50	Tls. 50	Tls. 75,000	Tls. 14,510	31-12-08	Final of Tls. 1½ making Tls. 3½ for 1908	7½ 7	Tls. 52½ buyers Tls. 53 sales
"Shell" Transport & Trading Co., Ld.	1898	£ 2,000,000	2,000,000	£1	£1	£720,000 i £100,000	£63,817	31-12-07	Second Interim of 1/- for a/c 1908	....	60/9- buyers
"Star" Ferry Co., Ld.	1898 1900	$200,000	10,000 10,000	$10 $10	$10 $5	$65,000 i $47,221	$98	30-4-08	$1.00 50 cts. for year ended 30-4-08	4 3½	$27 buyers $16 buyers
Taku Tug & Lighter Co., Ld.	....	Tls. 1,500,000	12) 30,000	Tls. 50	Tls. 50	Tls. 98,000 d Tls. 481,479 e Tls. 44,100 i Tls. 81,200 q Tls. 7,000	Tls. 2,215	31-12-08	Final of Tls. 1½ making Tls. 2½ for 1908	11	Tls. 45 sales
REFINERIES.											
China Sugar Refining Co., Ld.	1878	$2,000,000	20,000	$100	$100	e $350,000 r $56,848	*Dr.* $5858	31-12-08	$5 for year ending 31-12-08	3½	$145 sales
Luzon Sugar Refining Co., Ld.	1882	$700,000	7,000	$100	$100	none	*Dr.* $135,893	31-12-08	$3 for 1897	....	$15 sellers
Perak Sugar Cultivation Co., Ld.	....	Tls. 350,000	7,000	Tls. 50	Tls. 50	Tls. 100,000	Tls. 9,173	31-8-07	Tls. 3½ for year ending 31-8-08	....	Tls. 260 sales
MINING.											
Chinese Engineering & Mining Co., Ld.	1901	£1,000,000	1,000,000	£1	£1	d £175,000 h £12,289	£11,556	28-2-07	Int. of 1/6 for year ending 29-2-09 (Coupon No. 12)	7	Tls. 17.20 buyers
Raub Australian Gold Mining Co., Ld	1892	£200,000	150,000 50,000	£1 £1	18-10 £1	£4,873	*Dr.* £2,191	31-3-08	No. 12 of 1/-=48 cents	....	$9¼ buyers
DOCKS, WHARVES AND GODOWNS.											
Fenwick (Geo.), & Co., Ld.	1889	$450,000	z 18,000	$25	$25	$42,986	*Dr* $7,421	31-12-08	$1½ for year ending 31-12-06	....	$12
Hongkong & Kowloon Wharf & Godown Co., Ld.	1886	$3,000.000	60,000	$50	$50	$550,000 t $26,806 i $40,000	$30,102	31-12-08	Final of $1½ making $3½ for 1907	....	$59 buyers
Hongkong & Whampoa Dock Co., Ld.	1866	$2,500,000	50,000	$50	$50	i $97,199 v $200,000	$387,078	31-12-08	Final of $4 making $8 for 1908	11¾	$68 buyers
Shanghai Dock & Engin'g Co., Ld.	1906	Tls. 5,570,000	13) 55,700	Tls. 100	Tls. 100	Tls. 1,000,000	Tls. 33,742	30-4-08	Interim of Tls. 2½ for month ending 31-10-1908	6	Tls. 85 buyers
Shanghai & Hongkew Wharf Co., Ld.	1902	Tls. 3,600,000	36,000	Tls. 100	Tls. 100	b Tls. 697,257 r Tls. 50,000 e Tls. 125,000	Tls. 22,818	31-12-08	Final of Tls. 6 making Tls. 10 for 1908	6	Tls. 164 sales
LANDS, HOTELS AND BUILDINGS.											
Anglo-French Land Investment Co., Ld.	1906	Tls. 2,500,000	3) 25,000	Tls. 100	Tls. 100	Tls. 35,000	Tls. 4,314	29-2-09	Tls. 6 for year ending 29-2-09	5¾	Tls. 104 buyers
Astor House Hotel Co., Ld.	1901	$750,000	4) 30,000	$25	$25	$30,000	*Dr.* $4,200	30-6-08	$2½ for year ending 30-6-07	....	$20 sales
Astor House Hotel, Ld. (Tientsin)	....	Tls. 200,000	4,000	Tls. 50	Tls. 50	Tls. 35,000 e Tls. 10,000	Tls. 1,013	28-2-0	20 per cent. for 1906	....	Tls. 60
Central Stores, Ld.	....	$751,845	16) 50,123	$15	$15	n. $1,000	$24,641	31-12-08	$1.20 on old & 60 cts. on first new issue	....	$19 buyers
Hongkong Hotel Co., Ld.	1866	$600,000 $400,000	12,000 8,000	$50 $50	$50 $25	$648,975 r $13,912	$295	31-12-08	Final of $3 making $6 1908	....	$71 ex ni. $42 new issue
Hongkong Land Investment & Agency Co., Ld.	1889	$5,000,000	50,000	$100	$100	s $250,000	$26,475	31-12-08	Final of $3½ making $7 for 1908	7	$108 sales
Humphreys' Estate & Finance Co., Ld.	1887	$1,500,000	150,000	$10	$10	i $222,172 20) $43,261	$5,486	31-12-08	60 cents for 1908	6¾	$9½ sa. & buyers
Kowloon Land & Bldg. Co., Ld.	1889	$300,000	6,000	$50	$30	none	$278	31-12-08	$1½ for 1908	5	$30
Shanghai Land Investment Co., Ld.	1888	Tls. 3,900,000	78,000	Tls. 50	Tls. 50	Tls. 1,523.045 e Tls. 300,000	Tls. 142,404	31-12-08	Final of Tls. 3 & bonus of Tls. 2 making Tls. 8 for 1908	6¾	Tls. 120
Tientsin Land Investment Co., Ld.	1902	Tls. 772,600	7,726	Tls. 100	Tls. 100	i Tls. 75,308	Tls. 129	31-12-08	Final of Tls. 2 making Tls. 5 for 1908	....	Tls. 85 buyers
West Point Bldg. Co., Ld.	1889	$625,000	12,500	$50	$50	none	$1,968	31-12-08	Final of $2 making $4 for 1908	9	$44½ buyers
COTTON MILLS.											
Ewo Cotton Spinning & Weaving Co., Ld.	1895	Tls. 1,000,000	5) 20,000	Tls. 50	Tls. 50	Tls. 150,000 Tls. 45,939	Tls. 8,820	31-10-08	Tls. 5 for year ended 31-10-08	4½	Tls. 122 sellers
Hongkong Cotton Spinning, Weaving & Dyeing Co., Ld.	1901	$1,250,000	125,000	$10	$10	s $20,000	$9,553	31-7-08	50 cents for year ending 31-7-08	6	$8½

FAR EASTERN STOCKS AND QUOTATIONS—(CONTINUED.)

STOCK.	WHEN ESTABLISHED	CAPITAL.	NO. OF SHARES.	VALUE.	PAID UP.	RESERVE	AT WORKING ACCOUNT.	DATE.	LAST DIVIDEND.	Approximate Yield per cent. per annum at Present Quotation.	CLOSING QUOTATIONS
International Cotton Manufacturing Co., Ld.	1895	Tls. 750,000	6) 10,000	Tls. 75	Tls. 75	Tls. 175,000	Tls. 8,372	30-9-08	Tls. 6 for year end. 30-9-06 (8%).	....	Tls. 89 sellers
Laou-kung-mow Cotton Spinning & Weaving Co., Ld.	1895	Tls. 800,000	8,000	Tls. 100	Tls. 100	none	Tls. 4,829	31-12-08	Tls. 4 for 1908	....	Tls. 110 sellers
Soy Chee Cotton Spinning Co., Ld	1895	Tls. 1,000,000	2,000	Tls. 500	Tls. 500	*l* Tls. 31,172	Tls. 15,911	31-12-08	Tls. 50 for 1906	....	Tls. 400 sellers
MISCELLANEOUS.											
Bell's Asbestos Eastern Agency, Ld.	1895	£5,377.10s	11) 8,604	12/6	12/6	£1,500	£648	31-12-08	1s. 10½d. for 1907=$1.037	10	$10¼
China-Borneo Co., Ld.	1903	$720,000	8) 60,000	$12	$12	$40,000	Nil.	31-12-08	$1.20 for 1908	9½	$13 sales
China Light & Power Co., Ld. Do. do. Special Shares	1901 1907	$550,000	50,000 17) 50,000	$10 $1	$10 $1	none	$61,138	28-2-07	60 cents for year ending 28-2-06	....	$7¼ sales
China Provident Loan & Mortgage Co., Ld.	1898	*a* $1,250,000	7) 125,000	$10	$10	$100,000	$3,407	31-12-08	80 cents for 1908	8½	$9½ buyers
Dairy Farm Co., Ld.	1896	$300,000	40,000	$7½	$6	10,000 $8,000	$48	31-7-08	$1.30 for year ending 31-7-08	7¾	$16½
Green Island Cement Co., Ld.	1889	$4,000,000	400,000	$10	$10	$13,000	$3,756	31-12-08	Final of 50 cts. making 90 cts. for 1908	10¼	$8.80 sales
H. Price & Co., Ld.	1907	$120,000	19) 15.000	$10	$10	$5,000	$251	31-12-07	75 cts. for 9 months endg. 31-12-07	8	$12
Hall & Holtz, Ld.	....	$420,000	14) 21,000	$20	$20	$186,000	$8,957	28-2-09	$2 for year ending 28-2-09	9½	$21 buyers
Hongkong Electric Co., Ld.	1889	$600,000	60,000	$10	$10	none	$5,195	29-2-09	$1.00 and bonus 20 cents for year ending 29-2-09.	6½	$18¾ buyers
Hongkong Ice Co., Ld.	1881	$125,000	5,000	$25	$25	*k* $150,000	$7,616	31-12-08	Final of $15 per share making in all $19 for 1908	12¼	$155 sellers
Hongkong Rope Manufacturing Co., Ld.	1883	$600,000	$60,000	$10	$10	$20.000	$8,790	31-12-08	Final of $1 per share making $2 for 1908	8½	$24 sellers
Maatschappij tot Mijn-, Boschen Landbouwexploitatie in Langkat	1902	Gs. 2,500,000	25,000	Glds. 100	Glds. 100	Tls. 547,500 *i* Tls. 63,914 21 Tls. 547,500	Tls. 316,682	31-10-08	First quarterly dividend of Tls. 12½ for % 1909	4	Tls. 1130 buyers
Peak Tramways Co., Ld. Do. (New)	1907	$750,000	25,000 50,000	$10 $10	$10 $1	$5,000	$ 7,471	30-4-08	80 cents on fully paid shares & 6 cents on $1 paid shares for year ending 30-4-08	6 3	$14 buyers $2
Philippine Co., Ld.	1904	$750,000	75,000	$10	$10	none	Ps. 18.640	31-12-08	None	....	$8
Shanghai Gas Co., Ld.	1903	Tls. 800,000	24,000	Tls. 50	Tls. 50	*d* Tls. 100,000	Tls. 6,603	31-12 07	Interim of 7% Tls. 3½ for % 1908	6¾	Tls. 112½ buyers
Shanghai-Sumatra Tobacco Co., Ld.	1902	Tls. 600,000	9) 30,000	Tls. 20	Tls. 20	Tls. 24,820 *w* Tls. 75,000	Tls. 5,250	31-10-08	Final of Tls. 5 making Tls. 8 for 1908	4¾	Tls. 166 buyers
Shanghai Waterworks Co., Ld.	1881	£327,000	16,350	£20	£20	Tls. 220,000	Tls. 23,038	31-12-08	Final of 30/- making 45/- for 1908	....	Tls. 415 buyers
South China Morning Post, Ld.	1903	$150,000	6,000	$25	$25	none	*Dr.* $56,602	31-8-08	None	....	$24
Steam Laundry Co., Ld.	1902	$100,000	20,000	$5	$5	none	$236	31-5-08	40 cents for year ending 30-5-08	8	$5
Tientsin Waterworks Co., Ld.	1901	Tls, 200,000	2,000	Tls. 100	Tls. 100	Tls. 15,259 *e* Tls. 4,000	Tls. 201	30-4-07	Tls. 6½ for year ending 30-4-07	....	Tls. 94 buyers
Union Waterboat Co., Ltd.	1905	$500,000	15) 50,000	$10	$10	none	$172	31-12-08	60 cents for year-end, 31-12-1908.	5	$10½ buyers
United Asbestos Oriental Agency, Ld.	1896	$100,000	10,000	$10	$4	$35,000	$1,360	31-5-07	80 cts. on 9,900 ord shares & $19.80 on 100 founders shares for year ending 31-5-07	6¼	$13 buyers
Watson (A. S.) & Co., Ld.	1886	$900,000	90,000	$10	$10	$300,000 *e* $25,000	$6,438	31-12-07	Interim of 30 cents % 1908	6¾	$9
Weismann Limited	1904	$17,500	175	$100	$100	$6,700	$13	31-7-07	10 per cent for year endg. 31.7.07.	....	$150
William Powell, Ld.	1901	$105,000	15,000	$7	$7	none	$3.95	30-6-08	Final of 30 cents making 80 cents for year ending June 30th 1906	....	$4 sales.

LOANS AND DEBENTURES.	AGENTS' FOR THE LOAN.	AMOUNT OF LOAN.	PAR VALUE.	OUTSTANDING BONDS.	WHEN PAYABLE.	CLOSING QUOTATIONS.
China Government, 7 per cent. Silver Loan 1886 E	Hongkong & Shanghai Banking Corporation.	Tls. 767,200	Tls. 250	1914	Mar. 31st and Sept. 30th each year until Mar. 31st, 1917	par. Plus interest
Hongkong Hotel Company, Ltd., 6 per cent. Mortgage Debentures of 1899 ‡		$500,000	$500	§ all	Half yearly, June 30th and December 31st	par
Shanghai & Hongkew Wharf Company, Ltd., 6 per cent. Debentures of 1902		Tls. 543,900	Tls. 100	....	Half yearly, June 30th and December 31st	Tls. 103½
Astor House Hotel Company, Ltd., 8 per cent. Debentures of 1903		Tls. 500,000	Tls. 100	....	Half yearly, January 1st and July 1st	102½
Chinese Engineering & Mining Co., Ltd., 6 per cent. Debentures of 1903 †	....	£500,000	¶	£431,960	Half yearly, June 30th and December 31st	par.
International Cotton Manufacturing Co., Ltd. 7% Debentures of 1901	Russo Chinese Bank	Tls. 500,000	Tls. 100	‖	Half yearly, March 31st and Sept. 30th	Tls. 97½.
China Light and Power Co., Ltd. 6% Debentures of 1907 ***	....	$500,000	$100	....	Half yearly, June 30th and December 31st.	par.

a Authorized capital $2,000,000.
b Building Reserve Account.
c Capital Reserve Fund.
d Depreciation Fund.
e Equalization of Dividend Fund.
f Exchange and Investment Fluctuation Account.
g Gold Reserve Fund
h Exchange Reserve Account.
i Insurance Fund.
j Reinsurance Fund.
k Contingencies Account.
l Legal Reserve Fund.
m Authorized Capital
n Sinking Fund.

o Raw Sugar Reserve Account.
p Premium on New Issue.
q Boiler Repairs and Renewals Account
r Repairs and Renewals Account.
s Silver Reserve Fund.
t Depreciation and Repair Account
u Underwriting Suspense Account.
v Special account
w Special Works Fund.
x Extra Reserve Fund.
y 72,560 owned by the Company.
z 7,200 shares unissued.
1 4,000 shares unissued.
2 First issue of 60,000 of which 10,411 unallotted.

3 5,000 shares unissued.
4 4,480 shares unissued.
5 5,000 shares unallotted.
6 1,616 shares unallotted.
7 75,000 shares unissued.
8 14,000 shares unissued.
9 17,000 shares unissued.
10 40,453 shares actually issued.
11 7,688 shares actually issued.
12 4,200 shares unissued.
13 500 shares unissued.
14 399 shares unissued.
15 22,277 shares unissued.
16 10,000 shares unissued.
17 Special shares are entitled to half of the profits.

18 Capital contributed by Chinese Government Kuping Tls. 5,000,000.
19 12,000 issued only.
20 Typhoon and Floods Insurance Fund
21 Special Cash Reserve.
* Based on last year's dividend.
** Based on present dividend.
‖ Only Tls. 134,000 taken up.
§ 216 held by the Company.
¶ In certificates of £20 and £100.
‡ Redeemable in 10 years, or at option of Company, the Company giving 6 months notice.
† Redeemable at par at rate of £10,000 per annum from 31st December 1903 to 31st December 95.
*** Redeemable at par on 30th June, 1915.
Dr. Deficit.

ADDITIONAL SHANGHAI SHARE QUOTATIONS

STOCK	CLOSING QUOTATIONS	HIGHEST AND LOWEST PRICES DURING THE WEEK	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	LAST DIVIDEND	WHEN PAID
Oriental Consolidated Mining Co., Ltd.	27s. 6d.		G. $5,000,000	500,000	G. $10	G. $10	none	3rd Div. of Gold cents 50 making gold $1½ for year ended 30th June 1907.	Dec. 31, 1908
Kiang pei-ting Coal & Iron Mine Co., Ltd.	Tls. 50		Tls. 500,000	5,000	Tls. 100	Tls. 50	—	First year.	—
Vulcan Iron Works, Limited	Tls. 400		Tls. 500,000	1,000	Tls. 500	Tls. 500	—	Tls. 50 for year ended 31.8.06	Nov. 1, 1906
Yangtsze Wharf & Godown Co., Limited	Tls. 125 nominal		Tls. 250,000	2,500	Tls. 100	Tls. 100	Tls. 50,000	Tls. 15 for 1908	April 1, 1909
Wei-hai-wei Land & Building Co., Limited	Tls. 10 nominal		Tls. 91,850	3,674	Tls. 25	Tls. 25	—	——	—
Union Estate & Investment Co., Limited	Y. 105 sales		Y. 1,000,000	10,000	Y. 100	Y. 100	—	First year.	—
Grand Hotel, Limited	Y. 100 sellers		Y. 500,000	5,000	Y. 100	Y. 100	—	Interim Y. 5 for ½ year	Dec. 31, 1908
Hotel des Colonies Company, Limited	Tls. 9 sellers		Tls. 112,500	9,000	Tls. 12½	Tls. 12½	Tls. 29,783	6% for 1907	May 29, 1908
Kalee, Limited	$100 nominal		$400,000	4,000	$100	$100	—	$5 for 1907	May 22, 1908
Anglo-German Brewing Co., Limited	$85 buyers		$100,000	4,000	$100	$100	none	$7 for 1907	Mar. 12, 1908
Butler Tile Works, Limited	Tls. 50 nominal		Tls. 60,000	1,200	Tls. 50	Tls. 50	—	Tls. 3 for year ending 31.3.07	May 29, 1907
Major Bros., Limited	Tls. 40 sellers		Tls. 300,000	6,000	Tls. 50	Tls. 50	—	——	—
Oriental Ice Company, Limited	Tls. 50		Tls. 130,000	2,600	Tls. 50	Tls. 50	—	First year	—
Scharffs Oil and Bone Mills, Ltd.	Tls. 50		Tls. 200,000	4,000	Tls. 50	Tls. 50	—	First year	—
Shanghai Ice Company, Limited.	Tls. 13 sales		Tls. 200,000	8,000	Tls. 25		—	3% for 1907	Mar. 14, 1908
Shanghai Oil Co., Limited	Tls. 25		Tls 175,000	7,000	Tls. 25	Tls. 25	—	First year	—
Campbell, Moore & Co., Limited.	$10 buyers		$12,000	1,200	$10	$10	$9,000	$3 for 1905	Apr. 2, 1906
Dunning & Company, Limited	$50 sellers		$100,000	2,000	$50	$50	—	$5 year ending 28.2.08	Apr. 15, 1908
J. Llewellyn & Co., Limited	$50 buyers		$72,000	1,200	$60	$60	—	7.20 for 1908	Apr. 1, 1909
Lane, Crawford & Company	$137½ sales	137½	$250,000	2,500	$100	$100	—	Final of 7% making 14% for 1907	May 25, 1908
Mondon (E. L.) Limited	Tls. 6 buyers		Tls. 225,000	9,000	Tls. 25	Tls. 25	none	——	—
S. Moutrie & Company, Limited.	$48 sellers		$250,000	5,000	$50	$50	—	$4 for year ended March 31, 1908	June 18, 1908
Weeks & Company, Limited	$22 buyers		$400,000	20,000	$20	$20	$25,000	Interim of 80 cents for 1908	Dec. 14, 1908
Dominion Rubber Co., Limited.	Tls. 4		Tls. 225,000	22,500	Tls. 10	Tls. 4	—	First year	—
Kalumpong Rubber Co., Ltd.	Tls. 42 sellers		Tls. 700,000	14,000	Tls. 50	Tls. 50	** Tls. 11,844.48	6% for 1907	Nov. 29, 1908
Senawang Rubber Estates Company, Limited	Tls. 100		Tls. 250,000	2,500	Tls. 100 Tel. 100	Tls. 100 Tls. 75	—	——	—
Senawang Rubber Estates Company, New	Tls. 75								
Tebong Rubber and Tapioca Estate, Limited	20s.		£76,000	76,000	£1	£1	—	——	—
Eastern Fibre Co., Limited	Tls. 10 nominal		Tls. 300,000	30,000	Tls. 10	Tls. 10	—	——	—
Shanghai Mercury, Limited	Tls. 50 buyers		Tls. 105,500	2,100	Tls. 50	Tls. 50	—	Final of 6% making 10% for year ended 30.4.08	June 29, 1908
Shanghai Mutual Telephone Co., Limited	Tls. 57 buyers	57½	Tls. 675,000	13,500	Tls. 50	Tls. 50	—	Tls. 3 for 1907	June 28, 1908
China Export Import & Lumber Company, Limited	Tls. 92½ nominal		Tls. 350,000	500	Tls. 100	Tls. 50	—	10 p. c. for year ending 29.2.08	May 1, 1908
China Printing Co., Limited	Tls. 50		Tls. 750,000	1,500	Tls. 50	Tls. 50	—	7% 1908	Apr. 18, 1909
Dallas Horse Repository Co., Ltd.	Tls. 25 nominal		Tls. 250,000	5,000	Tls. 50	Tls. 50	—	——	—
Hirano Mineral Water Co., Ltd.	Y. 15 sales		Y. 125,000	5,000	Y. 25	Y. 25	—	10%=yen 2½ for year ending 30th Sept. 08 Y. 1.20 for year ended Feb. 29	Apr. 26, 1909
E. E. Porter & Co., Limited	$50		$100,000	2,000	$50	$50	--	$6 for 1907	Apr. 22, 1908
Shanghai Electric & Asbestos Company, Limited	$23 sales		$125,000	5,000	$25	$25	—	Final of 4% making 8% for 1907	May 29, 1908
Shanghai Electric Construction Company, Limited	£11 buyers	£11	£300,000	30,000	£10	£10	—	First year	—

DEBENTURES

LOANS	PRICE—PLUS ACCRUED INTEREST	AMOUNT OF LOAN	OUTSTANDING	NOMINAL VALUE	RATE OF INTEREST	WHEN PAYABLE
Shanghai Municipal Debentures 1892	Tls. 92½	Tls. 50,000	Tls. 45,400	Tls. 100	5 %	June & Dec.
do 1893	,, 96	,, 125,000	" 32,000	" 100	5½ ,,	Do
do 1894	,, 104½	,, 105,000	" 60,000	" 100	6 ,,	Do
do 1895	,, 92½	,, 115,000	" 32,600	" 100	5 ,,	Do
do 1896	,, 92½	,, 140,000	" 181,800	" 100	5 ,,	Do
do 1897	,, 92½	,, 268,800	" 268,400	" 100	5 ,,	Do
do 1898	,, 104½	,, 300,000	" 60,000	" 100	6 ,,	Do
do 1900	,, 96	,, 33,900	" 31,700	" 100	5½ ,,	Do
do 1901	,, 104½	,, 250,000	" 200,000	" 100	6 ,,	Do
do 1902	,, 104½	,, 150,000	" 150,000	" 100	6 ,,	Do
do 1903	,, 101½	,, 490.500	" 490,500	" 100	6 ,,	Do
do 1904	,, 104½	,, 214,500	" 214.500	" 100	6 ,,	Do
do 1905	,, 104½	,, 320.000	" 320,000	" 100	6 ,,	Do
do 1907	,, 104½	,, 250,000	" 250,000	" 100	6 ,,	Do
Chinese Imperial Government Loan 1886 E	,, 250	,, 767,200	" 354,400	" 250	7 ,,	Mar. & Sept
Shanghai Land Investment Co., Debentures 1890	,, 102	,, 250,000	" 250,000	" 100	6 ,,	May & Nov.
do 1892	,, 96	,, 250,000	" 250,000	" 100	5½ ,,	June & Dec.
do 1894	,, 101	,, 250,000	" 250,000	" 100	6 ,,	Mar. & Sept.
do 1896	,, 92½	,, 250,000	" 250,000	" 100	5 ,,	June & Dec.
do 1900	,, 102	,, 250,000	" 250,000	" 100	6 ,,	April & Oct.
do 1901	,, 102	,, 250,000	" 250,000	" 100	6 ,,	June & Dec.
do 1901	,, 96	,, 100,000	" 100,000	" 100	5 ,,	May & Nov.
do 1902	,, 102	,, 400,009	" 400,000	" 100	6 ,,	June & Dec.
do 1905	,, 102	,, 250,000	" 250,000	" 100	6 ,,	Do
Shanghai Waterworks Co., Debentures 1894	,, 103	,, 100,000	" 100,000	" 100	6 ,,	Mar. & Sept.
do 1896	,, 92½	,, 100,000	" 100,000	" 100	5 ,,	June & Dec.
do 1899	,, 103	,, 50,000	" 50,000	" 100	6 ,,	Do
do 1900	,, 103	,, 100,000	" 100,000	" 100	6 ,,	Mar. & Sept.
do 1902	,, 103	,, 100,000	" 100,000	" 100	6 ,,	Do
do 1903	,, 103	,, 100,000	" 100.000	" 100	6 ,,	June & Dec.
Perak Sugar Cultivation Co., Debentures 1902	,, 101	,, 200,000	" 200,000	" 100	7 ,,	April & Oct.
Shanghai Gas Co., Debentures 1897	,, 92½	,, 100,000	" 100,000	" 100	5 ,,	Do
do 1899	,, 102	,, 1,000,000	" 100,000	" 100	6 ,,	May & Nov.
do 1900	,, 102	,, 2,000,000	" 200,000	" 100	6 ,,	June & Dec.
Shanghai and Hongkew Wharf Co., Debentures 1902	,, 100½	,, 799,800	" 799,800	" 100	6 ,,	Do
Astor House Co., Debentures 1905	,, 103	,, 500,000	¶ " 500,000	" 100	7 ,,	Do
British Municipal Council, Hankow 1901	Sh. ,, 105	H'kow Tls 100,000	H'kow Tls 100,000	" 100	7 ,,	June & Dec.
Shanghai Club Debentures 1907	,, 96	Tls. 170,000	Tls. 170,000	" 100	6 ,,	Do
Country Club Debentures	,, 97	,, 139,000	" 139,000	" 100	6 ,,	Do
do 1907	,, 97	,, 92,000	" 92,000	" 100	6 ,,	Do
Lane Crawford & Co., Debentures 1907	,, 100	,, 110,000	" 110,000	" 100	7 ,,	Mar. & Sept.
Anglo-French Land Debentures 1908	,, 102½	,, 250,000	" 250,000	" 100	6 ,,	June & Dec.

SINGAPORE SHARE QUOTATIONS

(COURTESY MESSRS. FRASER & CO., BROKERS, SINGAPORE, MAY, 1909)

Date of Formation	Capital	Capital paid up	No. of Shares Issued	Issue Value	Paid up	Reserve	Last Dividend	Name	Buyers.	Sellers.	Closing Quotations
								MINING			
1903	$300,000	300,000	30,000	10	10	-----	10% for year ending 31-3-08	Belat Tin Mining Co., Ltd.	8.00	8.25	8.00
1907	$300,000	225,000	22,500*y*	10	10	-----		Bruang Ltd.	7.00	7.25	7.00
1901	$600,000	600,000	60,000	10	10	25,000	10% for year ending 30-4-08	Bruseh Hydraulic Tin Mining Co., Ltd.	7.50	8.00	7.50
1903	£500,000	444,769	444,769*a*	1	1	-----		Duff Development Co., Ltd.	5.50	6.00	6.00
1907	$400,000	375,000	37,500*b*	10	10	-----		Kanaboi, Ltd.	1.00	1.25	1.25
1901	£60,000	60,000	60,000	1	1	-----	2/- interim for 1908	Kinta Tin Mines, Ltd.	9.75	10.25	9.75
1906	£100,000	100,000	100,000	1	1	-----		Kledang Tin Mining Co., Ltd.	3.75	4.25	3.75
1905	$150,000	99,000	9,900*c*	10	10	6,485.68	35% for year ending 31-12-07	Kuantan Tin Mining Co., Ltd.	2.50	3.50	3.50
1906	£120,000	120,000	120,000	1	1	-----		Lahat Mines Ltd.	7.25	7.50	7.50
1906	£30,000	30,000	30,000	1	1	-----		Malaya and Siam Corporation, Ltd.	---	5/-	5/-
1906	$450,000	450,000	45,000	10	10	-----		Malacca Tin Dredging Co., Ltd.	2.50	2.75	2.50
1906	£250,000	179,500	500,000*h*	5/-	5/-	-----		Pahang Consolidated Co., Ltd.	1.4.9	1.6.0	1.4.9
			54,500	1	1	-----		" " " 7% *Pref.*	---	---	nominal.
1907	£100,000	80,000	80,000*i**	1	1	-----		Pengkalen, Ltd.	9.00	9.10	9.00
1904	£120,000	100,000	100,000*d*	1	1	6,000	45% for year ending 30-6-07	Pusing Lama Tin Mines, Ltd.	4.00	4.25	4.00
1907	$450,000	300,000	30,000*g**	10	10	-----		Rahman Hydraulic Tin Ltd.	---	7.50	7.50
1905	£27,000	27,000	27,000*e*	1	1	-----	1/- interim during 1907	Rambutan, Ltd.	---	6.50	6.50
1892	£200,000	191,250	50,000	1	1	4,873	1/- paid January 1901	Raub Aust. Gold Ming. Co., Ltd, *Fully pd.*	7.50	7.75	7.75
			150,000	1	18/10	-----	1/- " " "	" " " *Contributory*	7.00	7.25	7.25
1905	£40,000	40,000	40,000	1	1	-----		Redhills Tin Mining Co., Ltd.	3.00	3.25	3.00
1898	*Gs*2.500,000	2,500,000	25,000	100	100	-----	100% for year ending 31-12-08	Redjang Lebong Mining Co., Ltd.	---	---	1015.00
1900	$110,000	110,000	22,000	5	5	-----	3% for year ending 22-1-09	Royal Johore Tin Mining Co., Ltd.	1.20	1.30	1.30
1907	$550,000	500,000	50,000*o**	10	10	-----		Salak South, Ltd.	5.50	5.75	5.75
1907	£80,000	80,000	80,000	1	1	-----		Sempam Tin Mines, Ltd.	1.25	2.00	2.00
1906	$850,000	850,000	85,000	10	10	25,000	10% for year ending 31-12-08	Serendah Hydraulic Tin Ming. Co., Ltd.	7.00	7.15	7.00
1899	$230,000	230,000	23,000	10	10	-----	3% for ½ year ending 31-12-08	Sipiau Tin Co., Ltd.	4.50	5.00	4.50
1907	£90,000	70,000	70,000*z*	1	1	-----	-/6 interim for 1908	Tekka, Limited	11.25	11.50	11.25
1902	£160,000	160,000	160,000	1	1	-----	5/- during 1907	Tronoh Mines, Ltd.	9.10	9.25	9.10
								RUBBER			
1905	£150,000	137,062 10/-	46,500	1	1	-----	30% for year ending 31-12-08	Anglo-Malay Rub. Co., Ltd. *Fully paid*	6.0.0	6.2.6	6. 0. 0.
			103,500	1	17/6	-----	" " " " "	" " " *Contributory*	5.17.6	6.0.0	5. 17. 6
1905	$200,000	126,000	12,600*f**	10	10	7,400	12½% interim for 1908	Balgownie Rub. Estate Ltd. *Fully paid*	34.50	35.00	34.50
1904	£30,000	20,187 10/-	19,000 4,750*i*	1 1	1 5	----- -----		Batu Caves Rub. Co., Ltd.	4.17.6	5.0.0	4. 17. 6
1906	£80,000	70,000	70,000*v**	1	1	-----	5% for year ending 31-3-08	Batu Tiga (Selangor) Rubber Co., Ltd.	1.9.6	1.10.3	1. 9. 6
1907	£30,000	21,000	18,000*n**	1	1	-----		Bukit Lintang Rubber Estates, Ltd.	1.9.0	1.10.0	1. 10. 0
			6,000	1	10/-	-----		" " " *Contributory*	19/6	1.0.6	19/6
1903	£70,000	66,700	66,700*j*	1	1	-----	24% for year ending 31-12-08	Bukit Rajah Rubber Co., Ltd.	7.12.0	7.15.0	7. 12. 0
1906	£35,000	27,000	6,000	1	1	-----		Castlefield (K.) R. Estate, L., *Fully pd*	1.11.0	1.12.6	1. 11. 0
			24,000	1	17/6	-----		" " " " " *Contributory*	1.9.0	1.10.0	1. 9. 0
1906	$150,000	125,000	12,500*k*	10	10	-----		Castlewood Rubber Co., Ltd.	3.75	4.00	4.00
1904	£16,000	16,000	10,000	1	1	-----	17½% interim for 1908	Cicely Rubber Estates Co., Ltd.	8.10.0	9.0.0	8. 10. 0
			6,000	1	1	-----	20% interim for 1908	" " " " 5% *Pref.*	---	---	8. 12. 6
1905	£75,000	58,507	55,007*l* 7,000	1 1	1 10	1,000 -----	17½% for year ending 31-12-08	Consolidated Malay Rub. Estates, Ltd.	4.10.0	4.16.0	4. 16. 0
1906	110,000	102,500	102,500*u**	1	1	-----	12% for year ending 31-12-08	Damansara (Selangor) Rubber Co., Ltd.	3.2.6	3.5.0	3. 2. 6
1906	£310,000	274,973-5	181,454*m*	1	1	8,784	15% for year ending 31-12-08	Highlands & Lowds. Para Rub. Co., Ltd.	2.17.6	2.18.0	2. 18. 0
			123,546	1	15/-	-----		" " " " *Contributory*	2.5.6	2.10.0	2. 5. 6
1905	£50,000	36,500	23,000	1	1	-----		Kapar Para Rubber Estates, Co., Ltd.	2.11.0	2.15.0	2. 12. 6
			27,000	1	10/-	-----		" " " *Contributory*	---	---	1. 17. 6
1906	£180,000	180,000	180,000	1	1	-----	3% for year ending 30-6-08	Kuala Lumpur Rubber Co., Ltd.	2.1.6	2.3.6	2. 1. 6
1907	£100,000	81,000	90,000*r**	1	18/-	-----		Labu (F. M. S.) Rubber Co., Ltd.	1.15.0	1.17.6	1. 17. 6
1907	£320,000	232,395	197,395*c**	1	1	-----	10% for year ending 31-12-08	Lanadron Rubber Estates, Ltd.	3.0.0	3.5.0	3. 0. 0
			70,000	1	10/-	-----		" " " *Contributory*	1.19.6	2.0.9	2. 0. 9
1906	*Gs* 135,000	135,000	580	250	250	-----		Langen Rub. and Cocoanut Co., Ltd.	262.50	275.00	262.50
1908	£125,000	75,000	60,000*p**	1	1	-----		Ledbury Rubber Estates Ltd.	1.11.0	1.12.6	1. 11. 0
			40,000	1	7/6	-----		" " "	17/-	17/9	17/-
1895	£100,000	98,324 8/-	883,244*d**	2/-	2/-	4,000	60% for year ending 31-12-08	Linggi Plantations Ltd., *Ordinary*	1.0.6	1.1.0	1. 0. 6
			10,000	1	1	-----	7% for year ending 31-12-08	" " " 7% *Pref.*	---	---	1. 0. 0
1907	£140,000	107,000	107,000*n*	1	1	-----		London Asiatic R. & Produce Co., Ltd.	1.14.0	1.15.0	1. 15. 0
1906	£300,000	300,000	115,000	1	1	-----	7½% for year ending 31-12-07	Malacca Rubber Plants., Ltd. 7½% *Pref.*	2.12.6	2.15.0	2. 12. 6
			185,000	1	1	-----		" " *Ordinary*	2.7.6	2.10.0	2. 10. 0
1903	£30,000	22,500	22,500*o*	1	1	-----	45% for year ending 31-12-08	Pataling Rubber Estates Synd. Ltd.	10.15.0	11.0.0	10. 15. 0
1906	£85,000	85,000	85,000	1	1	-----		Perak Rubber Plantations, Ltd.	1.16.0	1.17.0	1. 16. 0
1906	$250,000	225,000	22,500	10	10	-----		Ragalla Rubber Co., Ltd. *Ordinary*	18.00	18.50	18.50
		25,000	2,500	10	10	-----		" " " 8% *Preference*	18.00	18.50	18.50
1904	£20,000	16,943 8/-	20,000*a**	1	1	-----		Sagga Rubber Company, Limited	3.4.0	3.7.6	3. 4. 0
1904	$100,000	100,000	1,000*j**	100	100	20,000	25% for year ending 31-1-09	Sandycroft Rubber Co., Ltd.	475.00	480.00	475.00
1907	£100,000	76,800	48,000*s**	1	1	-----		Seafield Rubber Co., Ltd.	2.7.6	2.10.0	2. 7. 6
			48,000	1	12/-	-----		" " " *Contributory*	2.0.0	2.2.6	2. 0. 0
1898	£30,000	30,000	300,000	2/-	2/-	3,000	75% for year ending 31-12-08	Selangor Rubber Co., Ltd.	1.9.0	1.10.0	1. 9. 0
1906	£65,000	65,000	65,000	1	1	-----		Shelford Rubber Estate, Ltd.	1.6.6	1.7.0	1. 7. 0
1905	$500,000	500,000	5,000	100	100	-----		Singapore Rubber Co., Ltd.	150.00	170.00	150.00
1903	$250,000	250,000	2,500	100	100	-----		Singapore & Johore Rub. Co., Ltd.	170.00	175.00	175.00
1906	£175,000	174,615	174,615*g**	1	1	-----	3% for year ending 31-3-08	Straits Settlements (B.) Rub. Co., Ltd.	1.7.6	1.8.0	1. 7. 6
1906	£110,000	100,000	100,000*k**	1	1	-----		Sungei Kapar Rubber Co., Ltd.	2.7.6	2.10.0	2. 7. 6
1907	£70,000	49,875	14,000	1	1	-----		Sungei Salak Rubber Co., Ltd.	1.12.6	1.15.0	1. 12. 6
			41,000	1	17/6	-----		" " " *Contributory*	1.10.0	1.12.6	1. 10. 0
1904	£50,000	45,710	41,920*p*	1	1	-----		Sungei Way (Selangor) Rub. Co., Ltd.	2.15.0	2.17.6	2. 15. 0
			7,580	1	10	-----		" " " *Contributory*	---	---	1. 10. 0
1907	£200,000	154,000	154,000*t**	1	1	-----	5% for year ending 31-12-08	United Serdang (S.) R. Plantations, Ltd.	2.10.0	2.12.6	2. 10. 0
1904	£60,000	50,600	506,000*q*	2/-	2/-	-----	25% interim for 1908	Vallambrosa Rubber Co., Ltd.	1.3.6	1.4.0	1. 4. 0
								GENERAL			
1894	£5,377.10.0	4,805	7,688*b**	12/6	12/6	1,500	15% for year ending 31-12-07	Bells Asbestos Eastern Agency, Ltd.	6.25	8.00	6.25
1908	$250,000	202,500	2,025*m**	100	100	-----		Brunei Oil Royalty, Ltd.	---	100.00	100.00
1907	$1,500,000	1,099,672	27,083*l** 118,406	10 10	10 7	----- -----	5% interim for 1908	Eastern Smelting Co., Ltd.	6.65	6.75	6.75
1898	$225,000	225,000	4,500	50	50	150,000	15% & 2½% bon. for yr. end. 31-12-08.	Fraser & Neave, Ltd.	142.50	145.00	142.50
1865	$15,000,000	15,000,000	120,000	125	125	15,000,000*t* 14,500,000*u* 250,000*v*	£2-0-0 per share and bonus of 5/- at ex.- 1/8¾ half year ending 31-12-08	Hongkong & Shanghai Bank'g Corpt'n.	---	---	90.0.0
1905	$2,400,000	2,400,000	18,000	100	----	75,000	2½% for year ending 31-10-08	Howarth Erskine, Ltd.	85.00	90.00	90.00
			6,000	100	----	-----	7% for year ending 31-10-08	" " 7% *Pref*	---	100.00	100.00
1896	$1,000,000	1,000,000	6,000	100	100	600,000	10% for year ending 31-12-07	Katz Brothers, Ltd. *Deferred*	---	125.00	125.00
			4,000	100	100	-----	8% " " " " "	" " 8% *Cum. Pref*	---	---	150.00 nominal
1901	$34,000	34,000	3,400	10	10	-----	20% for year ending 31-10-08	Maynard & Co., Ltd.	19.00	19.50	19.50
1899	$875,000	875,000	6,000	100	100	175,000	5% for year ending 31/12/08	Riley, Hargreaves & Co., Ltd.	57.50	60.00	60.00
			2,750	100	100	-----	7% for year ending 31/12/08	" " " " 7% *Pref.*	95.00	97.50	95.00
1898	£3,500,000	3,300,000	2,300,000	1	1	-----	10% for 1907	Shell Transport & Trading Co., Ltd. *Ord.*	3.0.0	3.2.6	3. 0. 0
			100,000*s**	10	10	-----		" " " " " " *Pref.*	---	---	nominal
1903	$600,000	250,000	25,000*r*	10	10	-----	7½% for year ending 30-6-08	Singapore Cold Storage Co., Ltd.	9.25	9.50	9.50
1891	$30,000	30,000	600	50	50	23,000	10% for year ending 31-7-08	Singapore Dispensary Ltd.	---	50.00	50.00
1903	£400,000	400,000	400,000	1	1	-----		Singapore Electric Tramways, Co., Ltd.	4/-	4/3	4/3
1904	$160,000	112,000	1,120*e**	100	100	11,200	5% for year ending 30/6/07	Straits Engineering Syndicate, Ltd.	---	30.00	30.00
1884	$200,000	200,000	2,000	100	100	35,000	10% during 1907	Straits Ice Co., Ltd.	---	150.00	150.00
1890	$500,000	498,000	4,980*h**	100	100	760,000*w*	10% for year ending 31-12-08	Straits Steam Ship Co., Ltd.	192.50	195.00	192.50
1887	$3,000,000	3,000,000	300,000	10	10	1,250,000 1,222,409*x*	10% & 5% bon. for half yr. end. 30-9-08	Straits Trading Co., Ltd.	51.50	52.00	51.50
								DEBENTURES			
								Howarth Erskine, Ltd. 6% ... $ 600,000	----	1%	1% prem.
								Riley, Hargreaves & Co., Ltd. 6% . 284,000	----	1%	1% prem.
								Sandycroft Rub. Co., Ltd. 7½% ... 22,100	----	----	par.
								Singapore Electric Tramways, Co., Ltd. 5% ... £350,000	----	----	nominal
								Singapore Municipal 6% ... 400,000	----	----	20% prem. nom.
								" " 5% ... 1,878,000	7%	----	7% prem.
								" " 4½% ... 1,600,000	3%	5%	3% prem.
								" " 4% ... 602,900	6%	par.	6% discount
								Straits Engineering Syndicate, Ltd. 6% ... 45,000	----	par	par.
								Tanjong Pagar Dock Board 5% . 1,050,000	par	----	par.

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a { 11,282 unissued
43,949 6% debenture }
b 2,500 unissued
c 5,100 "
d 20,000 "
e { 100,000 " *Ord.*
45,500 " *Pref.* }
f 6,250 "
g 3,300 "
h 2,500 "
i 12,993 "
j { 4,140 "
8,60 subscribed by employees }
k £40,000 6% Debentures 33,000 unissued
l 7,500 "
m 500 to be issued to employees

n 94,000 unissued.
o 35,000 "
p Special Gold Reserve Fund
q Silver Reserve Fund.
r Insurance Fund.
s Sundry Reserves.
t Sundry Reserves.
u 7,500 unissued.
v 20,000 "
w 4,595 part-paid shares
x 916 unissued
y 52,605 unissued.
z 16,756 "
*a** 480 "
*b** 7,400 "
*c** 15,000 unissued.
*d** 20 "

*e** 20,000 "
*f** 221 7½% Debentures.
*g** 10,000 unissued
*h** 4,511 "
*i** 475 "
*j** 6,000 "
*k** 5,000 "
*l** 25,000 "
*m** 385 forfeited
*n** 10,000 unissued.
*o** 4,000 "
*p** 46,000 "
*q** 7,500 "
*r** £10,000 Convertible 6% Debentures.
s { 200,000 unissued.
£720,000 Reserve. }

YOKOHAMA SHARE QUOTATIONS

COURTESY A. C. HUTTON POTTS, SHARE AND GENERAL BROKER, YOKOHAMA, MAY, 1909.

STOCKS.	CAPITAL.	NO. OF SHARES.	ISSUE VALUE.	AMOUNT PAID UP.	RESERVE FUND.	AT WORKING ACCOUNT OR CARRIED FORWARD.	DATE.	LAST DIVIDEND.	FOR TERM.	CLOSING QUOTATION.
Brett & Co., Ltd.	-Y- 28,000	2,800	-Y- 10	-Y- 10			31-12-07	10%	for 1 year	10 Nominal.
Club Hotel, Ltd.	185,000	1,850	100	100	3,000	-Y- 768.96	31-3-08	7%	for 1 year	70 Buyers.
Grand Hotel, Ltd.	500,000	5,000	100	100	10,000		31-12-08	3%	for ½ year	100 Buyers.
Helm Bros., Ltd.	186,000	3,720	50	50	25,000	-Y- 6,395.55	31-12-08	17½%	for 1 year	80 Sales,
Langfeldt & Co., Ltd.	150,000	1,500	100	100		Dr. 2,038.97	31-12-08		for ½ year	60 Nominal.
C. Nickel & Co., Ltd. †	500,000	20,000	25	25		1,782.10	31-10-08	20%	for 1 year	41 Sales.
Yokohama Engine and Iron Works *	500,000	10,000	50	50	50,000	-Y- 29,421.19	31-5-08	10%	for 1 year	70 Sales
Oriental Hotel, Ltd., Ordinary	250,000	3,000	50	50	306,090.49		31-8-07	12%	for 1 year	50 Nominal.
Oriental Hotel, Ltd., Preference		2,000	50	50				8%	for 1 year	50 Nominal.
The Union Estate and Investment Co., Ltd. ‡	1,000,000	10,000	100	100	6,000.00	1,753.03	30-9-08	7%	for 1 year	100 Nominal.

† 285,000 unissued.
‡ 475,000 unissued.

*-Y- 390,000 issued.
110,000 unissued.

DEBENTURE LOANS.	AMOUNT OF LOAN.	FACE VALUE OF DEBENTURES.	RATE OF INTEREST.	INTEREST PAYABLE.	CLOSING QUOTATION.
Brett & Company, Limited	11,500.00	100.00	7%	1 June and 1 Dec.	95 Sales.
Yokohama United Club	250,000.00	100.00	7%	30 June and 31 Dec.	100 Sales.
C Nickel & Company, Limited	50,000.00	100.00	8%	1 May and 1 Nov.	110 Sellers.
Oriental Hotel, Limited	250,000.00	100.00	8%	1 April and 1 Oct.	100 Sellers.
Union Estate and Investment Co., Limited	250,000.00	100.00	6%	30 June and 31 Dec.	95 Sellers.

JAPANESE STOCKS.	FACE VALUE.	AMOUNT PAID UP.	LAST DIVIDEND.	DIVIDEND PAYABLE.	CLOSING QUOTATION.
Bonds & Debentures.					
Exchequer Bonds 2nd issue	-Y-100	-Y-100	5%	March and Sept.	-Y-100.20
Exchequer Bonds 3rd issue	100	100	5%	March and Sept.	,, 99.20
Consolidated Bonds (Seiri)	100	100	5%	June and Dec.	,, 94.50
War Bonds (Gunji)	100	100	5%	June and Dec.	,, 94.50
Imperial 5% Bonds	100	100	5%	March and Sept.	,, 92.80
Special 5% Bonds (issued 1906)	100	100	5%	June and Dec.	,, 94.65
Yokohama Water Works Bonds	100	100	6%	June and Dec.	,, 99.00
Yokohama City Public Loan Bonds	100	100	6%	March and Sept.	,, 98.00
Osaka City Harbour Construction Bonds	100	100	6%	June and Dec.	,, 100.00
Osaka City Public Loan Bonds	100	100	6%	June and Dec.	,, 99.50
Kawasaki Dock Yards Co.'s Debentures	100	100	7%	June and Dec.	,, 99.00
Tokyo Race Associations "	500	500	30%	June and Dec.	,, 100.00
Railways & Electric Trams.					
Tokyo Railway Company, Limited	50	50	4%	June and Dec.	,, 57.30
Yokohama Electric Tramway Company, Limited	50	50	6%	July and Jan.	,, 39.50
Keihin Electric Tramway Company, Limited	50	50	10%	June and Dec.	,, 64.50
Southern Manchurian Railway Co., Ltd.	100	20	6%	June and Dec.	,, 28.50
Hanshin Electric Tramway Co., Ltd.	50	50	12%	May and Nov.	,, 106.00
Cotton Spinnings.					
Kanegafuchi Cotton Spinning Company, Limited	50	50	14%	July and Jan.	,, 94.75
Fuji Gassed-yarn Company, Limited	50	50	14%	July and Jan.	,, 95.00
Tokyo Cotton Spinning Company, Limited	50	50	5%	July and Jan.	,, 41.15
Imperial Hemp Weaving Company, Limited	50	50	12%	July and Jan.	,, 64.00
Nisshin Boseki Kabushiki Kaisha	50	12½	....	——	,, 12.50
Sugar & Beer Cos.					
Dai-nippon Sugar Refinery Company, Limited	50	50	15%	May and Nov.	,, 19.75
Ensuiko Sugar Refinery Company, Limited	50	15	20%	June and Dec.	,, 33.50
Dai-nippon Beer Company, Limited	50	50	15%	July and Jan.	,, 72.70
Kirin Brewery Company, Limited	50	50	6%	July and Jan.	,, 46.50
Docks & Steamships.					
Yokohama Dock Company Limited	50	33	12%	June and Dec.	,, 53.50
Uraga Dock Company, Limited	50	50	....	July and Jan.	,, 11.00
Kawasaki Dockyard Company, Limited	50	50	12½%	Feb. and Aug.	,, 55.70
Nippon Yusen Kaisha	50	50	12%	May and Nov.	,, 76.00
Hokkaido Tanko S. S. Company, Limited	50	50	14%	July and Jan.	,, 47.65
Miscellaneous.					
Tokyo Electric Light Company, Limited	50	50	11%	June and Dec.	,, 90.80
Tokyo Gas Company, Limited	50	50	13%	July and Jan.	,, 96.45
Yokohama Union Electric Light Company, Limited	50	50	14%	July and Jan.	,, 89.00
Fuji Paper Mills	50	50	6%	June and Dec.	,, 32.50
Otaru Timber Company, Limited	50	50	....	March and Sept.	,, 10.50
Hoden Petroleum Company, Limited	50	50	36%	April and Oct.	,, 90.70
Tokyo Rope Manufacturing Company, Limited	50	50	20%	June and Dec.	,, 103.00
Japan Horse Improvement Company, Limited	50	50	15%	March and Sept.	,, 6.00
Tokyo Stock Exchange Company	50	50	11⅜%	June and Dec.	,, 140.75
Osaka Electric Light Company, Limited	50	50	15%	July and Jan.	,, 124.50
Kobe Electric Light Company, Limited	50	50	14%	July and Jan.	,, 86.00

BANGKOK SHARE QUOTATIONS

(COURTESY MESSRS. EDWARDS & CO., BANGKOK, SIAM.)

NAME.	BUYERS.	SELLERS.	QUOTATION.	ESTABLISHED.	CAPITAL.	NO. OF SHARES.	ISSUE VALUE.	AMOUNT PAID UP.	RESERVE FUND	LAST DIVIDEND	WHEN PAID OR PAYABLE.
Siam Electricity Co., Ltd.	Tcs. —	Tcs. 370	Tcs. 370	1901	Tcs. 3,383,296	35,000	£ 10	£ 350,000	Tcs. 448,174.31	12% & 12½ T. bon.	Feb. 29, 1908
Paknam Railway Co., Ltd.	,, —	,, —	,, 185	1893	,, 400,000	5,000	Tcs. 80	Tcs. 400,000	,, 80,000	6% & 2 Tcl. bonus for ½ year ending	Dec. 31, 1907
Siam Tramway Co., Ltd.	,, —	,, 150	,, 150	1905	,, 1,450,000	6250 Shares 7250 Deb. 1000 P. Shares	,, 100	,, 1,450,000	—	2%	Mar. 31, 1908 Sept. 30, ,,
Meklong Railway Co., Ltd.	,, —	,, 105	,, 105	July 12, 1907	,, 2,230,000	22,300	,, 100	,, 2,230,000	17,316.22	—	—
Bangkok Manufact. Co., Ltd.	,, —	,, 130	,, 135	1898	,, 400,000	4,000	,, 100	,, 400,000	—	None	—
Howarth Erskine, Ltd.	,, —	,, —	,, 140	1905	$ 2,400,000	24,000	$ 100	$ 2,400,000	$ 40,000	5%	Oct. 31, 1908
Bangkok Dock Co., Ltd.	,, —	,, —	,, 150	1865	Tcs. 1,000,000	6,000	Tcs. 100	Tcs. 1,000,000	Tcs. 270,000 60,000	12½% & 2½ Bonus	Dec. 31, 1907
Siam Steam Packet Co.	,, —	,, 70	,, 70	1898	,, 190,000	2,625	,, 50	,, 131,250	,, 36,000	14%	Dec. 31, 1907
Siam Commercial Bank	,, —	,, —	,, 1,100	1906	,, 3,000,000	3,000	,, 1,000	,, 3,000,000	,, 140,000	5%	Mar. 31, 1907
Menam Motor Boat Co., Ltd.	,, —	,, —	,, 100	1905	,, 200,000	2,000	,, 100	,, 125,000	—	—	—
Transport Co., Motor, Ltd.	,, —	,, 100	,, 100	1906	,, 200,000	4,000	,, 100	£ 4, per Share	—	—	—
Jenderata Rubber Co *.	,, —	,, —	79		£ 17,580		£ 10				
Siam Steam Navigation Co., Ltd.	,, —	,, —	320		Tcs. 2,000,000		Tcs. 200				

*6 Calls paid

PHILIPPINE SHARE REPORT

JUNE 1ST, 1909

NAME	WHEN ESTABLSHED	AUTHORIZED CAPITAL	ISSUE VALUE OF SHARE	NO. OF SHARES	SUBSCRIBED	PAID UP	RESERVE	WORKING %	DATE	LAST DIVIDEND	CLOSING QUOTATIONS
American Drug Store	1908	₱ 100,000	₱1,000	100	40	₱1,000	......	₱ 5,000	Jan. 4, 1909..	....	No Sellers.
*Banco Español Filipino	1851	3,000,000	200	15,000	8,439	200	₱225,000	....	....	7% for year 1908....	190 nom.
Benguet Consolidated Mining Co.	1903	2,000,000	2	1,000,000	495,000	2	......	38,000	Feb. 2, 1909..	....	No Sellers.
Benguet Commercial Co., Ltd.	1908	200,000	10	20,000	7,360	10	......	....	....	7% for year 1907	₱10.
Cadwallader-Gibson Lumber Co.	1908	1,000,000	100	10,000	8,650	100	......	....	....	....	No Sellers.
*Camote-Clayton Mining Co.	1909	400,000	10	40,000	20,000	10	......	....	....	....	₱10.
*Compania Maritima	......	1,018,000	200	5,090	5,090	200	......	....	....	....	₱40 buyers
*El Varadero de Manila	......	350,000	100	3,500	3,500	100	......	....	....	....	Sellers 70
Export & Import Lumber Co.	......	200,000	200	1,000	1,000	200	......	....	....	....	No sellers.
*Fabrica de Hielo de Manila	......	350,000	50	7,000	7,000	50	......	....	....	18% for year 1908...	₱80 sellers
*Germinal Cigar Factory	......	500,000	500	1,000	1,000	500	₱285,000	....	....	6% for year 1908 and 6% on capital......	700 sellers
H. E. Heacock Co.	1909	100,000	100	1,000	800	100	......	....	....	First year..........	No sellers.
*Headquarters Mining Co. (Inc.)	1908	600,000	10	60,000	35,000	10	......	....	....	....	₱10.
Insular Lumber Co.	1907	2,000,000	200	10,000	9,000	200	......	....	....	....	No sellers.
Juan Seiboth Co., Ltd.	1908	150,000	20	7,500	500	20	......	....	....	First year..........	....
*La Concha Button Factory	......	75,000	100	750	750	100	......	....	....	10% for year 1908...	₱110 sellers.
Lambert, Springer Co.	1908	200,000	1,000	200	80	1,000	......	....	....	....	No sellers.
Luzon Stevedoring Co.	1909	250,000	25	10,000	4,200	25	......	....	....	First year..........	....
Newspaper Publishing Co.	1907	400,000	100	4,000	3,740	100	......	....	Dec. 31, 1908.	½ of 1% interim for 1908..............	No sellers.
Walter E. Olsen Co., Inc.	1909	500.000	100	5,000	2,033	100	......	....	....	First year..........	No sellers.
Paracale Gold Dredging Co.	1907	£10,000	£1	10,000	9,000	£1	......	....	....	....	£1.10 s.
Palomar Park Amusement Co.	1908	300,000	......	300,000	60,312	.50	......	....	....	....	₱1.
Phil. Hemp Machine Co., Ltd.	1907	1,000,000	100	10,000	8,500	100	......	....	....	....	₱100
Philippine Publishing Co.	1907	600,000	200	3,000	2,181	200	......	....	Mar. 1st, 1909	₱3 a share for 1908..	₱50
Port Banga Lumber Co.	1908	100,000	1.000	100	934	93,400	None.	40,000	First Saturday in January..	None..............	No sellers.
The Philippine Gold Dredging Co.	1907	200,000	10	20,000	20,000	10	......	....	....	....	No sellers.
*Philippine Co., Ltd.	......	750,000	10	7,500	7 500	10	......	....	....	....	₱5 buyers.
Philippine Rosin & Turpentine Co.	......	150,000	1	150,000	70,000	1	......	....	....	First year..........	....
The Rosenstock Pub. Co.	1908	75,000	10	7,500	6,000	10	......	....	....	....	No sellers.
*San Nicolas Iron Works	......	300,000	500	600	600	500	......	....	....	....	₱200 sellers.
San Mauricio Gold Mining Co.	1908	4,000,000	200	20,000	......	....	......	....	....	First year..........	No sellers.
Tarlac Railway Co.	1906	150,000	100	1,500	1,500	100	......	₱9,674.75	June 30, 1908.	....	No sellers.
Union Hemp Machine Co.	1909	50,000	10	5,000	2,600	10	......	....	....	....	No sellers.
Zamboanga Cold Storage Co.	1903	40,000	400	100	200	200	₱ 8,500	....	May 1st, 1909.	20%..............	₱120.

* John T. Macleod's share list

PHILIPPINE BONDS

	DATED	AUTHORIZED	ISSUED	OUTSTANDING	PAR VALUE	RATE OF INT.	WHEN PAYABLE	LAST QUOTATION
Philippine Friar Land Bonds	Feb. 1st, 1904	$7,000,000	$7,000,000	$7,000,000	$ 100	4%	Feb. 1, 1914	104⅝
Public Works and Permanent Improvement Bonds	March 1, 1905	$5,000,000	$2,500,000	$2,500,000	$ 100	4%	March 1, 1915	104⅝
Do.	Feb. 1, 1906		$1,000,000	$1,000,000	$ 100	4%	Feb. 1, 1916	104⅝
Manila Sewer and Water Works Improvement Bonds	June 1, 1905	$4,000,000	$1,000,000	$1,000,000	$ 100	4%	June 1, 1915	104½
Do.	Jan. 2, 1907		$2,000,000	$2,000,000	$ 100	4%	Jan. 2, 1917	104⅝
*Philippine Railway First Mortgage Four per cent Thirty Year Sinking Fund Gold Bonds	July 1, 1907	$15,000,000	$5,736,000	$5,736,000	$1000	4%	July 1, 1937	97

*Payment of interest guaranteed until maturity or redemption by the Philippine Government.

EXAMINATIONS AND
REPORTS FOR FINANCING

CABLE ADDRESS:
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C. G. YOUNG
ENGINEERING AND CONSTRUCTION
Sixty Wall Street, New York

EXPERIENCE COVERS:

New Zealand, South America, Australia, United States, Canada, Philippine Islands, and is prepared to handle business throughout China, Japan and the Far East.

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Cia. General de Tabacos de Filipinas.
Ynchausti & Co.

ASBESTOS GOODS
C. E. Helvie
Shanghai Electric & Asbestos Co., Ltd.

BANKS
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Hongkong and Shanghai Banking Corp.
International Banking Corp.
Banco Español Filipino

BOILER MAKERS
Vulcano Metal Works
Nicolas, Tsu
San Nicolas Iron Works
Babcock & Wilcox (D. W. Bell)

BOILERS (PATENT WATER TUBE STEAM)
General Electric Co.
Jardine Matheson & Co.

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San Miguel Brewery

BRIDGE-BUILDERS
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White & Co., Inc., J. G.
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CEMENT
Anderson & Co., W. H.
Chee Hsin Cement Co., Ltd.
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Arnhold, Karberg & Co.
Shanghai Electric & Asbestos Co., Ltd.
Shewan Tomes & Co.
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Siemens Shuckert
Siemssen & Co.

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East Asiatic Dredging Co.
Atlantic, Gulf & Pacific Co.
Carmichael & Clarke.
White & Co. Inc. J. G.
C. G. Young

DIVING APPARATUS
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DREDGERS
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Arnhold, Karberg & Co.
Brighten, Malcolm & Co., Ltd.
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Siemens Shuckert
Siemssen & Co.
Shewan, Tomes & Co.

ELECTRICAL SUPPLIES
Arnhold Karberg & Co.
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Babcock & Wilzox (D. W. Bell)
Belliss & Morcom (D. W. Bell)
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Siemssen & Co.

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Swift & Co.

GAS. ENGINES
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Castle Bros.-Wolf & Sons
C. E. Helvie
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Truscott Boat Mfg. Co.
Detroit Engine Works

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New Metropole Hotel

ICE MACHINERY
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JOURNALS, SCIENCE
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Jardine, Matheson & Co.
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Shewan, Tomes & Co.
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MINING COMPANIES
Chinese Engineering & Mining Co.

MOTORS
Caille Perfection Motor Co.
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Detroit Engine Works

MOTOR LAUNCHES
Earnshaw, M. & Co.
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PUMPS
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South Manchuria
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Siemssen & Co.

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New Amoy Dock Co., Ltd.
Sabang Bay Harbor & Coal Co., Ltd.
Shanghai Dock and Engineering Co., Ltd.
Tanjong-Pagar Dock Board
Earnshaw, M. & Co.

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China and Manila S. S. Co., Ltd.
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Occidental and Oriental S. S. Co.
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Toyo Kisen Kaisha S. S. Co.
Transatlantica S. S. Co.
Ynchausti & Co.

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STRUCTURAL STEEL
Bohler Bros. & Co.
A. Gulf & Pacific Co.

SUGAR MACHINERY
Fogarty, James H.

SURVEYING INSTRUMENTS
Ilbert & Co.

TANKS
Atlantic, Gulf & Pacific Co.
Pacific Tank Co.

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